Vol. 892 Number 2

OFFICIAL GAZETTE

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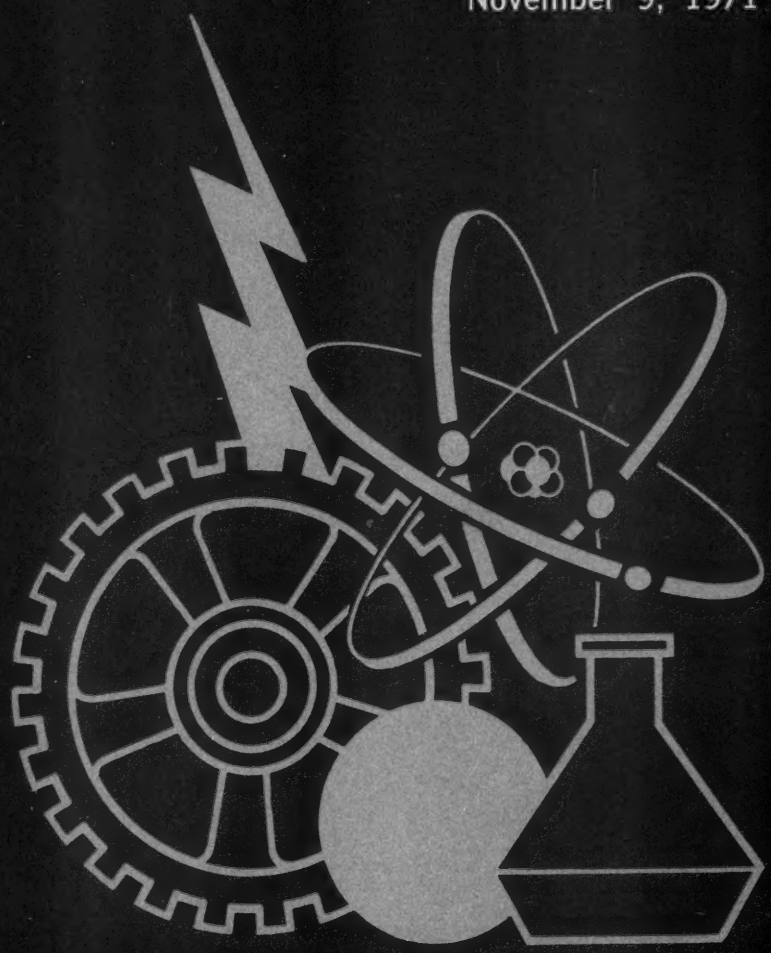
PATENTS

November 9, 1971



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 9, 1971 Volume 892 Number 2

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PATENT OFFICE NOTICES

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral or ethical grounds should be furnished the Commissioner of Patents on or before November 29, 1971.

Birch, Anthony L., 5420 Bradley Blvd., Bethesda, Md. 20014
Bitner, Ronald G., P.O. Box 2223, Sta. D, Ottawa, Ontario, Canada
Deluca, Alfred A., 12 Harrogate Place, Ottawa, Ontario, Canada
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Fassi, Aldo, Via Sassetti, 12, Milan, Italy
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Leman, John F., P.O. Box 8305, Ottawa, Ontario, Canada
Lemon, Francis W., 175 Bronson Ave., Apt. 409, Ottawa, Ontario, Canada
McKenzie, R. Dale, 190 Howland Ave., Toronto, Ontario, Canada
Pole, Frank I., 21 Parkside Crescent, Ottawa, Ontario, Canada
Straznicky, Ivan, 15 Rockway Crescent, Apt. 16, Ottawa, Ontario, Canada
Turpin, Frank, 2125 Bel-Air Drive, Ottawa, Ontario, Canada
Wood, Brian J., 833 Pigott Road, Richmond, British Columbia, Canada

ROBERT GOTTSCHALK,
Oct. 13, 1971. *Chairman, Committee on Enrollment.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,561,489, Bloch and Hansen, METHOD AND MEANS FOR CHEMICAL ANALYSIS BY NUCLEAR INDUCTION, **filed** June 4, 1971, D.C., S.D.N.Y., Doc. 71–C–2506, *Varian Associates* v. *Brucker Scientific, Inc.*

2,653,526, W. E. Peery, PRINTING SYSTEM FOR PHOTOCOMPOSING MACHINES OR THE LIKE; **2,787,654,** same, ELECTRONIC PHOTO-TYPE COMPOSING SYSTEM, **filed** Dec. 10, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c2552, *Compugraphic Corporation* v. *The Singer Company.* Order dismissing action with prejudice, Apr. 2, 1971.

2,787,654. (See 2,653,526.)

2,838,877, K. C. Working, SOIL CONDITIONING, **filed** Apr. 19, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–937–RJK, *Sapphire Process Corporation* v. *Johnson Sawdust, Inc.*

3,288,034, White, White and White, ROTARY MOTOR OR PUMP, **filed** Mar. 24, 1971, D.C., E.D. Mich. (Detroit), Doc. 36244, *Hydro-Comp., Inc.* v. *TRW Inc.*

3,300,643, R. C. McCall, THERMOLUMINESCENT RADIATION DOSIMETER READOUT APPARATUS USING NITROGEN GAS IN THE READOUT CHAMBER, **filed** Mar. 24, 1971, D.C., N.D. Ga. (Atlanta), Doc. 14,903, *Isotopes, Inc.* v. *The Harshaw Chemical Company, a division of Kewanee Oil and Joseph H. Piersante.* Same, **filed** Mar. 24, 1971, D.C., N.D. Ga. (Atlanta), Doc. 14,904, *Isotopes, Inc.* v. *Eberline Instrument Corporation, and James B. Cambell.*

3,306,774, E. G. Keeton, SEED PLANTER, **filed** Apr. 8, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c868, *Eugene G. Keeton* v. *Raymond C. Fischer and International Harvester Co.*

3,315,548, Anderson and Connoy, METHOD OF MAKING BAND SAW BLADE, **filed** Mar. 17, 1971, U.S. Ct. of App., 1st Cir., Mass. (Boston), Doc. 71–1081, *Contour Saws, Inc.* v. *L. S. Starrett Company.* Same, **filed** Mar. 17, 1971, U.S. Ct. of App., 1st Cir., Mass. (Boston), Doc. 71–1082, *Contour Saws, Inc.* v. *L. S. Starrett Company.*

3,316,582, Johnston and Higginbotham, VISCOUS LIQUID DAMPING DEVICES, **filed** Feb. 28, 1968, D.C., N.D. Ind. (South Bend), Doc. 4160, *Ridge Products, Inc.* v. *Clark's Discount Department Store.* Stipulation of dismissal filed without prejudice, Jan. 6, 1970.

3,327,745, Meece and Dew, TREE CUTTER DEVICE, **filed** Oct. 2, 1968, D.C., N.D. Fla. (Tallahassee), Doc. TCA–1443, *Harrington Mfg. Co., Inc.* v. *Idas B. White.* Judgment for defendant, Feb 24, 1971.

3,330,406, R. H. Taub, COLLAPSIBLE DISPLAY BIN, **filed** Apr. 20, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c941, *Charles Kirshbaum and Ethel Taub* v. *GTE Sylvania Inc.*

3,334,752, P. R. Matravers, DUAL MEDIA FILTER ELEMENT, **filed** Apr. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1032, *The Carborundum Co.* v. *Purolator Inc.*

3,337,394, White and Buchanan, FOIL TYPE GRAINAGE APPARATUS FOR PAPER MAKING MACHINES, **filed** Mar. 10, 1971, D.C., N.D.N.Y. (Utica), Doc. 71–CV–114, *Johnson Foils Inc.* v. *Huyck Corp.*

3,350,733, D. C. Hanna, CAR WASHING DEVICES, **filed** Feb. 9, 1968, D.C., E.D.N.Y. (Brooklyn), Doc. 68–C–137, *Daniel C. Hanna* v. *Trans-World Car Systems, Inc. and Howard E. Grant.* Consent judgment for injunction, Mar. 18, 1971.

3,353,478, S. Hopkins, WASTE COLLECTING AND COMPACTING UNIT, **filed** Mar. 11, 1970, D.C., E.D. La. (New Orleans), Doc. CA–70–582, *Trash Masters Corp. and Stephen Hoplins* v. *Sears, Roebuck & Co.* Ordered and decreed, dismissed by joint motion of parties, Feb. 9, 1971.

3,357,561, Schmid and Anderson, ROOF DRAIN, **filed** May 17, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71525, *Zurn Industries Inc.* v. *Barrett-Rupp Inc. and Jay R. Smith Mfg. Co.*

3,358,619, H. E. Pareira, KITCHEN UTENSILS FOR HANDLING AND DISPENSING ICE CREAM AND THE LIKE, **filed** Apr. 23, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–995–AAH, *Herbert E. Pareira* v. *United States Consumer Products, Inc.*

3,361,150, J. E. Horner, WATER CONDITIONING CONTROL SYSTEM, **filed** May 20, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–979–FW, *Universal Interloc, Inc.* v. *Magna Corporation.* Consent judgment, plaintiff is owner of patent, defendant has infringed. Settlement agreement of May 17, 1966 is valid. All defendant's counterclaims and all claims are dismissed with prejudice, Apr. 9, 1971.

3,372,493, L. Birch, ANTIQUED PAINTING ON WOOD AND BY-THE-NUMBER SYSTEM OF MAKING THE SAME, **filed** Mar. 12, 1968, D.C., S.D.N.Y., Doc. 68–C–1047, *Avalon Manufacturing Corp.* v. *The Art Award Co., Inc.* Order dismissing action for lack of prosecution without prejudice, Mar. 19, 1971.

3,377,716, A. R. Schmoyer, METHOD OF AND APPARATUS FOR TEACHING THE OPERATION OF A KEYBOARD CONTROLLED MACHINE OR INSTRUMENT, **filed** June 2, 1971, D.C. Md. (Baltimore), Doc. 71–598–H, *Arthur R. Schmoyer and Don S. Wenger* v. *International Music Corporation and Clark Music Centers.*

3,385,649, C. M. Hicks, CANDLE PACKAGE AND METHOD OF MAKING CANDLE, **filed** Mar. 16, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c665, *Charles M. Hicks* v. *Chicago Candle Corporation.*

3,389,286, L. A. Guthart, VIBRATION ACTUATED CONTACT SWITCH, **filed** Nov. 5, 1970, D.C.N.J. (Newark), Doc. C–1485–70, *Alarm Device Manufacturing Co., etc.* v. *On-Guard Corporation of America et al.* Consent judgment for permanent injunction, Apr. 22, 1971.

3,390,652, N. K. Morris, HAND HELD AND OPERATED SEWING MACHINE, **filed** Sept. 19, 1968, D.C.N.J. (Trenton), Doc. 943–68, *Nathan K. Morris, doing business as N. K. Morris Manufacturing Company* v. *Spencer Gifts, Inc., a subsidiary of M.C.A. Inc. and Bernard Barber.* Order of dismissal without prejudice, Mar. 23, 1971.

3,390,893, O. F. Maclaren, STRUCTURES FOR FOLDING BABY CARRIAGES, CHAIRS, AND THE LIKE, **filed** Apr. 28, 1971, D.C., W.D.N.Y. (Buffalo), Doc. C–1971–199, *Owen Finlay Maclaren and Miron Charles Bell* v. *Genesee Plastic Company, Inc.*

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, filed Apr. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1026, *Advance Transformer Co.* v. *Sears, Roebuck & Co. and Litton Industries Inc.*

3,395,790, J. A. Smith, APPARATUS FOR SETTING HAIR, filed May 4, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1078–JWC, *Clifton C. Cottrell, trustee* v. *Morris-Flamingo, Inc.*

3,396,460, J. D. Wetmore, METHOD OF MAKING A CONNECTION, filed Apr. 21, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71–764, *Raychem Corp.* v. *Sigmaform Corp.*

3,404,334, C. L. Marshall, COLOR TELEVISION TEST APPARATUS, filed Jan. 11, 1971, D.C., S.D. Ind. (Indianapolis), Doc. IP71–C–21, *Cecil L. Marshall* v. *Radio Corporation of America.*

Certificates of Correction for the Week of Nov. 9, 1971

D. 218,944	3,566,790	3,579,266	3,585,186
D. 219,958	3,567,120	3,579,425	3,585,479
D. 220,906	3,568,091	3,579,459	3,585,524
3,362,918	3,569,747	3,579,524	3,585,860
3,395,150	3,569,981	3,579,607	3,586,054
3,473,110	3,570,227	3,580,123	3,586,231
3,492,393	3,570,620	3,580,745	3,586,293
3,518,303	3,571,494	3,581,082	3,586,302
3,524,679	3,571,607	3,581,132	3,586,425
3,546,356	3,571,783	3,581,141	3,586,743
3,551,092	3,571,932	3,581,149	3,586,862
3,555,629	3,572,390	3,581,220	3,586,947
3,557,958	3,572,874	3,581,617	3,586,973
3,558,517	3,572,973	3,581,908	3,587,003
3,561,949	3,573,303	3,582,090	3,587,373
3,562,276	3,573,313	3,582,137	3,587,689
3,562,521	3,573,652	3,582,389	3,588,225
3,564,220	3,574,195	3,582,390	3,588,764
3,564,243	3,574,662	3,582,723	3,589,643
3,564,572	3,575,050	3,582,906	3,591,794
3,565,048	3,575,980	3,583,288	3,593,282
3,565,367	3,576,423	3,583,915	3,594,271
3,565,820	3,576,952	3,584,284	3,595,920
3,566,013	3,577,169	3,584,814	3,597,424
3,566,116	3,578,509	3,584,955	
3,566,199	3,579,137	3,585,140	

Disclaimers

Reissue No. 26,881.—*Roland E. Kreibich, Harlan G. Freeman,* and *Gene F. Baxter,* Seattle, Wash., and *Karl F. Kumli,* Chico, Calif. METHOD OF PRODUCING AN ORTHO-DIRECTED PHENOLIC RESIN BY CONDENSING PHENOL AND HCHO IN THE PRESENCE OF A BIVALENT METAL ION AND THEN ADDING RESORCINOL, AND THE RESULTANT PRODUCT. Patent dated May 19, 1970. Disclaimer filed July 29, 1971, by the assignee, *Weyerhaeuser Company.*

Hereby enters this disclaimer to claims 1–7 of said patent.

3,473,110.—*James Theodore Hardin,* Lambertville, and *Rodger Thomas Lovrenich,* Temperance, Mich. ELECTRONIC CONDUCTOR DETECTOR AND INDICATOR. Patent dated Oct. 14, 1969. Disclaimer filed July 25, 1969, by the assignee *Eltra Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to June 11, 1985.

3,595,631.—*Irwin Broverman,* Orange, Conn. COMPOSITE ALUMINUM ALLOY. Patent dated July 27, 1971. Disclaimer filed Apr. 20, 1971, by the assignee, *Olin Corporation.*

Hereby disclaims all that portion of the term of the patent subsequent to Apr. 4, 1984.

Disclaimer and Dedication

3,582,896.—*Sigmund Silber,* Elizabeth, N.J. METHOD OF CONTROL FOR A DATA PROCESSOR. Patent dated June 1, 1971. Disclaimer and dedication filed Aug. 2, 1971, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby disclaims and dedicates to the Public the portion of the term of the patent subsequent to Dec. 1, 1987.

Dedications

Plant Pat. No. 1,504.—*Roy L. Byrum,* Richmond, Ind. ROSE PLANT. Patent dated July 31, 1956. Dedication filed Sept. 21, 1971, by the assignee, *Joseph H. Hill Company.*

Hereby dedicates its entire interest in the said patent to the Public of the United States.

Plant Pat. No. 1,566.—*Roy L. Byrum,* Richmond, Ind. ROSE PLANT. Patent dated Feb. 12, 1957. Dedication filed Sept. 21, 1971, by the assignee, *Joseph H. Hill Company.*

Hereby dedicates its entire interest in the said patent to the Public of the United States.

Plant Pat. No. 1,774.—*Sidney Reece* and *Roy L. Byrum,* Richmond, Ind. ROSE PLANT. Patent dated Nov. 25, 1958. Dedication filed Sept. 21, 1971, by the assignee, *Joseph H. Hill Company.*

Hereby dedicates its entire interest in the said patent to the Public of the United States.

Plant Pat. No. 1,886.—*Roy L. Byrum,* Richmond, Ind. ROSE PLANT, Patent dated Dec. 8, 1959. Dedication filed Sept. 21, 1971, by the assignee, *Joseph H. Hill Company.*

Hereby dedicates its entire interest in the said patent to the Public of the United States.

Plant Pat. No. 2,626.—*Roy L. Byrum,* Richmond, Ind. ROSE PLANT. Patent Dated Apr. 26, 1966. Dedication filed Sept. 21, 1971, by the assignee, *Joseph H. Hill Company.*

Hereby dedicates its entire interest in the said patent to the Public of the United States.

Patents Available for Licensing or Sale

D. 184,807. CHAPEL ALTAR RAIL UNIT. Cecile Farrand, 1261 Hoover, Apt. 3, Menlo Park, Calif., 94025.

2,716,558. CARRYING AND ROLLING TRANSPORT DEVICE. Anna K. Sullivan, 4077 W. 3rd St., Room 225, Los Angeles, Calif., 90020.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poinclanna Drive, Martinez, Ga., 30907.

3,296,733. FISHING LURE. Robert E. McLean, 5517 Cedar, Raytown, Mo., 64133.

3,521,903. FLEXIBLE SAFETY GUARD. Dwight Rister, 809 E. Mills Ave., Indianapolis, Ind., 46227.

3,541,362. ELECTROMAGNETIC GENERATORS. Robert Prouit. Correspondence to: Southwest International, Inc., P.O. Box 374, Albuquerque, N. Mex., 87103.

3,550,570. FLOW CONTROL SYSTEM. Harry M. Reid, 4159 Buena Vista Bldg., Dallas, Tex., 75204.

3,580,408. RECEPTACLE DISPOSAL CONTAINER ADAPTER. Augustus L. Newton. Correspondence to: Walter G. Finch, 1501–1503 Fidelity Bldg., Baltimore, Md., 21201.

3,589,658. STABILIZER FOR GARBAGE CANS AND THE LIKE. Elmer L. Kopfman, 743 3rd St., Colusa, Calif., 95932.

3,595,452. LOAD CARRYING RACK. Bernard M. Anderson, 135 E. Clay St., Monmouth, Oreg., 97361.

3,596,297. MODULAR FURNITURE. Herbert James, 207 W. 22nd St., Lorain, Ohio, 44052.

3,597,768. HOLDING TANK FOR MOBILE VEHICLE. Arthur W. Wofford, 324 Willis Ave., Rio Linda, Calif., 95673.

3,598,272. SELF OPENING BOTTLE CAP. Jose A. Bustamante. Correspondence to: Sheldon I. Cohen, Pennsylvania Building, Washington, D.C., 20004.

3,599,258. COMBINATION HANDS-AND-FEET SWIMMING FINS. Steve A. Murawski. Correspondence to: Sherman Levy, Suite 635, Washington Bldg., 15th St. and New York Ave. NW., Washington, D.C., 20005.

3,611,703. WATCH FOR INDICATING TIME OF TWO GEOGRAPHIC ZONES. Jean-Louis E. Borel, Synchron, S.A., Moladiere 71, 200 Neuchatel, Switzerland.

The following 2 patents are offered by: J. Roderick Jarrett, Jarrett & Runner, Suite 1410, Security Bank Bldg., Fresno, Calif., 93721.

3,421,249. FISH HOOK.

3,413,749. COMPARTMENTED FISH LURE.

The following 3 patents are offered by: M. L. Forsyth, 345 S. State St., Suite 101, Salt Lake City, Utah, 84111.

3,603,419. COMBINATION COVER AND TRAILING SLEIGH FOR TRACTION SNOW VEHICLES.

3,583,662. MECHANISM FOR RELEASABLY ATTACHING OBJECTS TO A KITE STRING.

3,572,037. EXTERNAL COMBUSTION ENGINE.

3,542,366. COMBINATION WHEELED VEHICLE SLOPING TRACK, LOOP AND SCORING MAT.

General Electric Company is prepared to grant non-exclusive licenses under the following 63 patents upon reasonable terms to domestic manufacturers.

Applications for licenses under the following patent may be addressed to: General Electric Company, Patent Counsel, Housewares Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,561,500. WIRE FORMING APPARATUS AND METHOD.

Applications for licenses under the following patent may be addressed to: Patent Counsel, Metallurgical Products Dept., General Electric Company, Box 237–GPO, Detroit, Mich., 48232.

3,598,447. CUTTER BITS AND BLOCKS FOR MINING MACHINES.

Applications for licenses under the following 7 patents may be addressed to: General Electric Company, Appliance Components Business Div., 1635 Broadway, Fort Wayne, Ind., 4684. Attn: Patent Counsel.

3,500,083. NOISE EXCITATION SUPPRESSION MOTOR MOUNTING SYSTEM.

3,515,919. STATOR ASSEMBLY FOR SINGLE PHASE INDUCTION MOTOR.

3,562,902. METHOD FOR TRANSFORMING AND TESTING OF ELECTRICAL COILS IN AN INDUCTIVE DEVICE.

3,573,686. MAGNETIC SWITCH.

3,573,698. THERMOSTAT CONTROL MECHANISM.

3,579,788. APPARATUS FOR COMPRESSING LAMINATED CORES.

3,590,293. DYNAMOELECTRIC MACHINE HAVING A STATIONARY ASSEMBLY OF THE PERMANENT MAGNET TYPE.

Applications for sublicenses under the following 25 patents may be addressed to: General Patent Counsel, General Electric Co., 570 Lexington Ave., New York, N.Y., 10022.

3,124,675. PHOTOELECTRIC TAPE READER.

Re. 26,212. ELECTROSTATIC RECORDING HEAD.

3,172,611. TAPE REELER.

3,185,911. CONTROL CIRCUIT FOR TAPE DRIVE MECHANISM.

3,261,566. TAKEUP FOR ACCOMMODATING SLACK AND TENSION VARIATIONS.

3,265,900. TAPE READER WITH INPUT CLIPPING CIRCUIT INCLUDING PHOTOSENSITIVE MEANS.

3,269,626. ADJUSTABLE SUPPORT FOR PRESSURE FIXING ROLLERS.

3,293,495. CONTROL CIRCUITS.

3,295,497. ELECTROSTATIC RECORDERS.

3,314,360. INFORMATION TRANSFER SYSTEM HAVING PLURAL STAGE MEMORY.

3,316,836. ELECTROSTATIC PRINTING SYSTEM HAVING MEANS TO MAKE PLURAL COPIES.

3,319,050. INFORMATION TRANSFER SYSTEM.

3,323,700. WEB DRIVING SYSTEM WITH DRIVING, BRAKING AND MOTION SENSING UNITS ADJACENT EACH MARGIN OF THE WEB.

3,335,322. CHARGE HEAD ARRAY FOR ELECTROSTATIC PRINTING SYSTEM.

3,347,481. TAPE TRANSPORT METHOD.

3,362,325. ELECTROSTATIC PRINTER EMPLOYING BELT TYPE STENCIL THRU WHICH IONS ARE DEPOSITED.

3,372,400. ELECTROSTATIC RECORDER WITH PLURAL ELECTRODES AND BIASED MASK.

3,389,381. COMMUNICATION SYSTEM.

3,400,656. ELECTROSTATIC DUPLICATOR FOR REPRODUCING AN IMAGE FROM ELECTRICAL CHARGE RETAINING INK PARTICLES FIXED IN PLACE.

3,405,857. COMBINED READER-REELER WITH VARIABLE TENSION WEB CONTROL.

3,439,650. INFORMATION TRANSFER AND INK PARTICLE REFINING SYSTEM.

3,458,655. HIGH SPEED PRINTING SYSTEM FOR CONVERTING INFORMATION SIGNALS INTO LEGIBLE REPRESENTATIONS.

3,481,775. ELECTROSTATIC PRINTING MEDIA.

3,489,325. CONTROL SYSTEM WITH MULTICHAMBER VACUUM UNIT FOR REGULATING LATERAL WEB ALIGNMENT.

3,550,792. INK PARTICLE RESERVOIR.

Applications for licenses under the following 29 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,051,818. ELECTRIC RANGE WITH SPILL-PROOF COOKING SURFACE.

3,177,334. OVEN DOOR WINDOW.

3,177,335. THERMOSTAT PROBE FOR COMBINED UHF AND INFRARED ENERGY COOKING OVEN.

3,293,394. TEMPERATURE RESPONSIVE CONTROL DEVICE WITH SNAP ACTING SWITCH.

3,315,121. CROSSED-FIELD ELECTRIC DISCHARGE DEVICE.

3,321,605. ELECTRONIC OVEN.

3,377,562. MAGNETRON DEVICE HAVING A COOLING ARRANGEMENT AND CAPACITIVELY COUPLED OUTPUT CIRCUIT.

3,388,231. ELECTRONIC HEATING APPARATUS AND MICROWAVE COUPLING STRUCTURE AND TRANSMISSION LINE THEREFOR.

3,413,516. CROSSED-FIELD DISCHARGE DEVICES AND OSCILLATORS AND AMPLIFIERS INCORPORATING THE SAME.

3,421,115. MICROWAVE COUPLING STRUCTURE AND TRANSMISSION LINE.

3,439,144. ELECTRONIC OVEN.

3,443,150. CROSSED-FIELD DISCHARGE DEVICES AND MICROWAVE OSCILLATORS AND AMPLIFIERS INCORPORATING THE SAME.

3,445,784. ULTRA-HIGH FREQUENCY CONTROL AND POWER SUPPLY SYSTEMS.

3,456,151. CROSSED-FIELD DISCHARGE DEVICE AND COUPLER THEREFOR AND MICROWAVE CIRCUITS INCORPORATING THE SAME.

3,458,753. CROSSED-FIELD DISCHARGE DEVICES AND COUPLERS THEREFOR AND OSCILLATORS AND AMPLIFIERS INCORPORATING THE SAME.

3,458,755. CROSSED-FIELD DEVICE AND MICROWAVE CIRCUITS INCORPORATING THE SAME.

3,459,921. ELECTRIC AND ELECTRONIC OVEN WITH A HEATED DOOR STRUCTURE.

3,459,994. CROSSED-FIELD DISCHARGE DEVICE AND IMPROVED MAGNETIC POLE STRUCTURES THEREFOR.

3,493,709. SPIRAL ANTENNA FOR ELECTRONIC OVEN.

3,497,656. ELECTRONIC RANGE.

3,510,724. CROSSED-FIELD DISCHARGE DEVICE AND MEANS FOR BALANCING THE RF ANODE-CATHODE VOLTAGES THEREOF.

3,511,958. ELECTRONIC OVEN INCLUDING MICROWAVE COUPLING STRUCTURE AND FOLDED CAVITY FILTERS THEREFOR.

3,529,114. TWO-POSITION PHASE-MATCHING DEVICE FOR ELECTRONIC OVENS.

3,536,878. ELECTRONIC HEATING APPARATUS INCLUDING MICROWAVE COUPLING STRUCTURE AND FILTERS THEREFOR.

3,551,735. CROSSED-FIELD DISCHARGE DEVICES AND OSCILLATORS AND AMPLIFIERS INCORPORATING THE SAME.

3,559,094. LOW VOLTAGE A.C. MAGNETRON.

3,584,255. CROSSED-FIELD DISCHARGE DEVICE.

3,586,826. SURFACE HEATING UNIT WITH A REMOVABLE SUPPORT.

3,587,557. SELF-CLEANING GAS OVEN.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 19, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-08-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-24-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-24-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-19-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-04-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	2-16-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-24-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-06-70
PHYSICS, GROUP 260—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	8-25-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	10-06-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-28-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	7-01-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	11-02-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	8-10-70

Expiration of patents: The patents within the range of numbers indicated below expire during November 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,602,987 to 2,605,997, inclusive
Plant Patents..... Numbers 1,312 to 1,327, inclusive

REISSUES

NOVEMBER 9, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

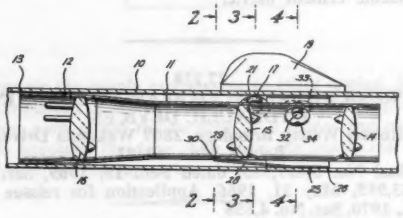
27,222
ERECTOR SUPPORT FOR TELESCOPE SIGHTS

William R. Weaver, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.

Original No. 3,429,634, dated Feb. 25, 1969, Ser. No. 457,438, May 20, 1965. Application for reissue Feb. 16, 1970, Ser. No. 1,993

Int. Cl. G02b *21/00, 23/00, 7/00*

U.S. Cl. 350—54 7 Claims



The present invention pertains to an improved support structure for an erector system in a telescopic firearm sight including a simplified pivot and simplified spring mechanism. The pivot includes an enlarged end on the erector tube (in which the erector lens system is located) for mating with the surface bore wall of the telescope barrel, thereby forming a circular pivot for radially pivoting the erector tube and which allows slidable, longitudinal movement of the erector tube, as well. The spring mechanism radially secures and biases the erector tube with respect to the telescope barrel at a longitudinal position from the pivot, providing a first force component that biases the windage control means and a second force component that biases the elevation control means. Described embodiments of the spring mechanism include a compressible, flat length portion having an end turned inwardly to engage a slot on the erector tube and having its other end stressed against the telescope barrel by a securably releasable connection. One embodiment also includes an arcuate section that partly surrounds the erector tube and contacts the telescope barrel bore at a location more than circumferentially half-way around the bore from the location of the flat length portion.

27,223
PRESS LOADER AND UNLOADER

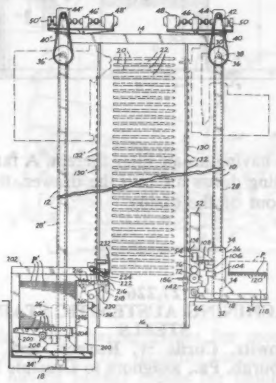
Victor R. Nelson, 2700 SW. Summit Drive, Lake Oswego, Oreg. 97034

Original No. 3,390,792, dated July 2, 1968, Ser. No. 599,552, Dec. 6, 1966. Application for reissue Jan. 26, 1970, Ser. No. 889,760

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 R 16 Claims

Hot press panel loading and unloading apparatus having indexing mechanisms associating the spaces between panel press platens with panel loading mechanism and panel unloading mechanism for moving the latter mechanisms stepwise to succeeding platen openings. The unloading and loading mechanisms operate simultaneously to unload a pressed panel from one platen opening while a pre-pressed panel is being loaded into the next adjacent



platen opening from which a pressed panel has just previously been unloaded.

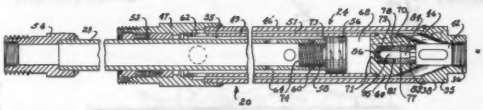
27,224
FLUID FEED LINES

John T. Parrett, Benton Harbor, Mich., assignor to Koehring Company, Milwaukee, Wis.

Original No. 3,318,199, dated May 9, 1967, Ser. No. 499,464, Oct. 21, 1965. Application for reissue Apr. 16, 1969, Ser. No. 824,008

Int. Cl. F15b *11/08;* F16l *27/12*

U.S. Cl. 91—462 8 Claims



A reciprocable fluid feed line for conveying fluid either to or from a remote load including a first tube having a second tube telescopically received therein with a piston on the end of the inner tube, there being provided passageways through the tubes to pressurize the side of the piston tending to retract the tubes, and a vent for the side of the piston which if pressurized would tend to extend the tubes.

27,225
FLOW CONTROL FOR VENTILATING HOOD

James E. Stalker, Dallas County, Tex., assignor to Home Metal Products Company, Plano, Tex.

Original No. 3,387,431, dated June 11, 1968, Ser. No. 426,782, Jan. 21, 1965. Application for reissue May 26, 1969, Ser. No. 835,287

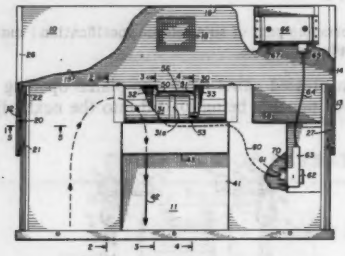
The portion of the term of the patent subsequent to May 3, 1983, has been disclaimed

Int. Cl. B01d *46/00*

U.S. Cl. 55—470 19 Claims

A ventilating kitchen hood including a casing in the form of a rectangular polyhedron with a short wide

front opening and having a drawer slidable through the front opening. The drawer has an intake port extending across a portion of the bottom panel and includes



duct structure having an air filter therein. A fan mounted within the casing draws air into the drawer, through the air filter and out of the casing.

27,226

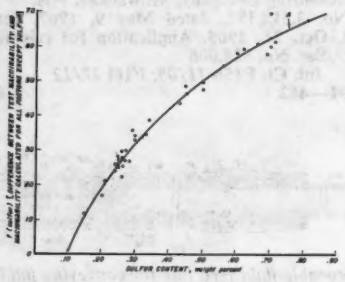
FREE-MACHINING AUSTENITIC STAINLESS STEELS

Arthur Moskowitz, Curtis W. Kovach, and Ralph G. Wells, Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Original No. 3,437,478, dated Apr. 8, 1969, Ser. No. 455,863, May 14, 1965. Application for reissue Jan. 8, 1970, Ser. No. 6,606

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 P **4 Claims**



This invention relates to chromium-nickel austenitic stainless steels having improved physical properties, most notably, significantly improved machinability. Specifically, it has been found that steels of this type containing up to 0.50% carbon, from about 0.25 to about 0.45% sulfur, from about 2.0 to about 7.0% manganese, from about 16 to about 30% chromium, from about 5 to 26% nickel, and wherein the manganese-to-sulfur ratio is about at least 8 to 1, are vastly improved with respect to machinability without impairing the corrosion resistance of the alloy to the expected extent at the achieved level of machinability. Optional elements that may be included in the alloy are silicon up to about 3%, molybdenum up to about 4%, zirconium up to about 1%, copper up to about 4%, selenium, tellurium or lead up to about 0.5% each, columbium, tantalum or titanium up to about 2.0% total, nitrogen up to about 0.35%, and phosphorus up to about 0.50%.

27,227

PERMEABLE CEMENTING COMPOSITION AND METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

No Drawing. Original No. 3,428,121, dated Feb. 18, 1969, Ser. No. 597,521, Nov. 29, 1966. Application for reissue Feb. 25, 1970, Ser. No. 14,251

Int. Cl. C04b *7/02;* **E21b** *33/13, 43/02*

U.S. Cl. 166—276 **18 Claims**

The invention relates to a method of and composition for the treatment of an incompetent formation penetrated by a well bore to prevent the movement of sand particles from the formation to the well bore during recovery of the formation fluids by forming a [slurry] *treating composition* of sand, cement and water in a hydrocarbon carrier oil, injecting the [slurry] *treating composition* into the formation under pressure, permitting the cement to set and form a permeable barrier [film] between the formation and well bore and recovering fluids from the formation through the formed permeable cement barrier.

27,228

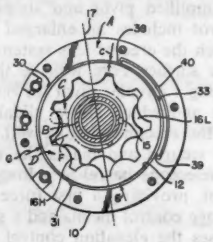
PRESSURE BALANCED BEARING LOADS IN HYDRAULIC DEVICES

Robert Wesley Brundage, 2809 Wakonda Drive, Belnor, Mo. 63121

Original No. 3,427,983, dated Feb. 18, 1969, Ser. No. 553,995, May 31, 1966. Application for reissue Jan. 21, 1970, Ser. No. 4,558

Int. Cl. F01c *1/04, 21/02*

U.S. Cl. 418—71 **22 Claims**



A bearing support system for a hydraulic device in which the clearance between the bearing surfaces is greater than normal, i.e. between 0.0015 to 0.010 inch per inch of diameter. Hydraulic fluid is supplied at a pressure to the bearing clearance at a plurality of spaced places. Other places on the bearing surface spaced from the high pressure places are in communication with the low pressure of the hydraulic device, whereby the hydraulic fluid flows through the bearing clearance from the places of high pressure to places of low pressure.

27,229

MOTION PICTURE APPARATUS WITH AUTOMATIC REWIND

John D. Mitchell, Kenneth W. Thomson, and Morris E. Brown, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

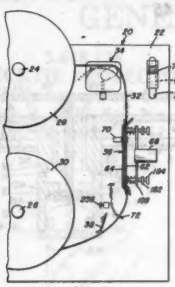
Original No. 3,240,550, dated Mar. 15, 1966, Ser. No. 218,492, Aug. 20, 1962. Application for reissue Aug. 19, 1969, Ser. No. 853,571

Int. Cl. G03b *23/00*

U.S. Cl. 352—124 **9 Claims**

An automatic rewind device is provided in a motion picture apparatus which includes a film-tension sensing

device. The film is fed along a path from a supply reel, to which the end of the film is attached, to a take-up reel. Upon reaching the end of the film an increase in film tension causes the sensing device, through a mechanical linkage, to uncouple the take-up reel from a drive shaft



and couple the supply reel thereto to effect rewind. Near the completion of the rewind operation a sensor adjacent the film path senses the passage of a leader end of the film to uncouple the drive shaft from the supply reel and couple it to the take-up reel.

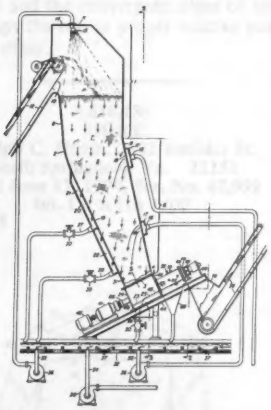
27,230
JUICE EXTRACTION APPARATUS

John Farmer, Honolulu, Hawaii, assignor to Ward Foods, Inc., New York, N.Y.

Original No. 3,432,344, dated Mar. 11, 1969, Ser. No. 408,944, Nov. 4, 1964. Application for reissue Feb. 5, 1970, Ser. No. 13,225

Int. Cl. C13d *1/10, 1/12, 1/04*

U.S. Cl. 127—3 **23 Claims**



Apparatus for extracting juice from disintegrated juice-containing material including a hopper having a lower part inclined toward a side and tapered toward its bottom, a plurality of vertically spaced injectors for injecting diluent liquid into the top and on to the upper side of the inclined portion of the hopper, a valved outlet on the lower side of the inclined portion for and spaced below each injector, and a multi-barrelled screw press at a bottom of the hopper for positively withdrawing the material therefrom, each barrel having an annular orifice variable in area by a plug shiftable axially on the related screw shaft, and interconnected means for shifting the plugs and equalizing the pressures in the barrels.

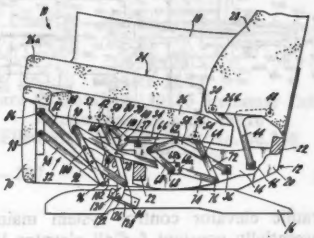
27,231
RECLINING AND ROCKING CHAIR

Peter S. Fletcher, 200 NW. 15th St., Delray Beach, Fla. 33444

Original No. 3,339,972, dated Sept. 5, 1967, Ser. No. 431,013, Feb. 8, 1965. Application for reissue Oct. 22, 1968, Ser. No. 782,495

Int. Cl. A47c *1/02*

U.S. Cl. 297—259 **12 Claims**



A reclining chair having means for mounting a seat, back-rest and leg rest for reclining movement in an arm frame and having further means for mounting the arm frame on a base for rocking movement on that base. And further including means responsive to reclining movement to lock out or prevent rocking movement and means responsive to rocking movement to lock out and prevent reclining movement.

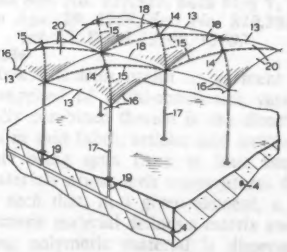
27,232
AIR SUPPORTED SHELTER

Terence Wyndham McLorg, 34 Thorncrest Drive, Islington, Ontario, Canada

Original No. 3,391,504, dated July 9, 1968, Ser. No. 622,708, Mar. 13, 1967. Application for reissue May 22, 1970, Ser. No. 39,878

Int. Cl. E04b *1/345*

U.S. Cl. 52—2 **9 Claims**



The invention relates to an air supported shelter for sheltering a large ground area from the elements. The shelter may be permanent, for covering a city for example, or temporary, for covering an exhibition ground or sports arena. The shelter consists of a reinforced flexible, translucent, membrane spanning the area and supported by internal area pressure. Air outlets are provided at the tops of the domed membrane sections, and fresh air is drawn or pumped into the enclosed space from its periphery, this air generally rising and passing into the atmosphere via the outlets.

27,233

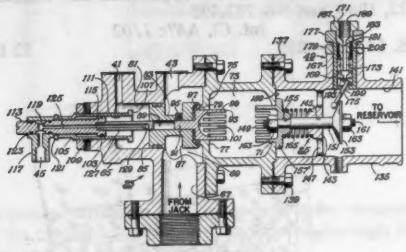
HYDRAULIC ELEVATOR CONTROL SYSTEMS

Everett E. Johnston, Newark, Tex., assignor to Esco Elevators, Inc., Fort Worth, Tex.

Original No. 3,438,398, dated Apr. 15, 1969, Ser. No. 629,520, Apr. 10, 1967. Application for reissue Apr. 13, 1970, Ser. No. 28,158

Int. Cl. B66b *1/24, 5/04*

U.S. Cl. 137—608 2 Claims



Hydraulic elevator control system maintains down-speed essentially constant for all elevator loads. Device positively responsive to fluid flow through down-control valve controls a metering valve to regulate fluid flow in a down-control valve bleed line to regulate the degree of opening of the down-control valve main flow aperture.

27,234

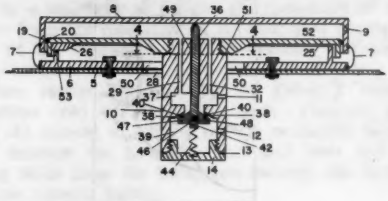
HYDRAULIC LIFTING DEVICE WITH WEIGHT ESTIMATOR

Alois J. Smieja, Nehalem, Oreg. 97131

Original No. 3,456,749, dated July 22, 1969, Ser. No. 750,976, Aug. 7, 1968. Application for reissue Apr. 2, 1970, Ser. No. 25,306

Int. Cl. G01g *5/04, 19/10*

U.S. Cl. 177—146 12 Claims



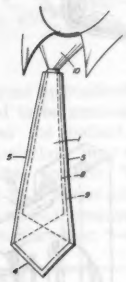
A hydraulic lifting device, with a large diameter minimum travel piston sleeve, used for balancing or estimating loads in trucks, trailers or places where small clearances are involved and no stationary scales are available to prevent hazardous over-loading or over-balancing. A check valve limits the travel of the piston sleeve and closes a pressure chamber so that a stable pressure reading or signal can approximate the load or balance this device is lifting.

PATENTS

GRANTED NOVEMBER 9, 1971

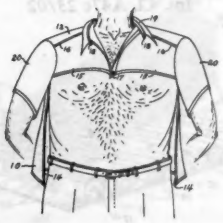
GENERAL AND MECHANICAL

3,618,138
NECKTIE PROTECTOR
Louis Retzkin, 24 Holly Lane, Port Chester, N.Y. 10573
Filed Mar. 2, 1970, Ser. No. 15,456
Int. Cl. A41d *27/12*
U.S. Cl. 2—46 **3 Claims**



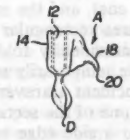
A tie bib for the protection of conventional four-in-hand ties against food spillage and spotting is provided by the present invention. The tie bib, which has convergent sides and generally resembles the shape of a four-in-hand tie, is constituted of a front panel with rearward folding flaps which form a sheath when they are folded back against the tie by means of the front panel. The force exerted by the folded flaps and the convergent edges of both the bib and the tie, keeps the two in proper relative position with respect to each other.

3,618,139
SHIRT
Adolph C. Hugin, 7602 Boulder St., North Springfield, Va. 22151
Filed June 17, 1970, Ser. No. 47,092
Int. Cl. A41b *1/00*
U.S. Cl. 2—115 **9 Claims**



A shirt-type garment comprising a full waist-length back panel having a width substantially around the back from between armpits, a front united to the rear panel along the top thereof and having a width to close across the chest and a length adjacent to the armpits. Sleeves extend from the shoulder-armpit sides of the front and rear panel. The front may comprise a pair of front panels, each secured at the arm sides thereof to one of the sleeves and having means for detachably securing together the other sides thereof to form a neck opening with the back panel.

3,618,140
SCARF HAT
Barbara L. Goldfarb, 30165 Stellamar Drive, Birmingham, Mich. 48010
Filed May 25, 1970, Ser. No. 40,230
Int. Cl. A42b *5/00*
U.S. Cl. 2—207 **3 Claims**



A scarf hat composed of a substantially rectangular thin sheet of fibrous material, which corner portions are successively folded, stitched and gathered together around a longitudinal pliable filler insert, which provides and retains the shape of the finished scarf hat having substantially the appearance of a bonnet.

3,618,141
STIFFENED FABRIC ARTICLE AND METHOD OF MANUFACTURE
George H. Collingwood, Hopewell, and Gene C. Weedon and Robert C. Winckhofer, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 727,325 and Ser. No. 727,327, both May 7, 1968. This application Apr. 29, 1969, Ser. No. 820,331
Int. Cl. D03d *13/00, 15/02*
U.S. Cl. 2—236 **12 Claims**

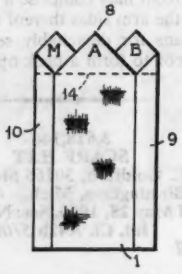
Stiffened fabric articles useful as garment liners are provided, comprised of multi-constituent yarn elements unidirectionally combined therein in the direction of desired stiffness in said fabric article; said multi-constituent yarn elements being spun from at least two different polymeric materials whose melt temperatures differ by at least 10° C. such that, in a given element, a first fiber-forming polymeric material defines a matrix and a second higher melting polymeric material is dispersed therein in the form of discontinuous fibrils, said matrix comprising at least about 50 percent by weight of the element and having a lower melting point than said dispersed fibrils; and said fabric article having been heat-treated at a temperature in the range above the melting point of the matrix but below the melting point of the dispersed fibrils such that the desired unidirectional degree of stiffness is imparted thereto, and whereby fabric strength and appearance are retained. The multi-constituent yarn elements are present in the fabric as individual yarn or fill elements in combination with other materials, or are present in a mechanically blended fiber or yarn with other materials.

3,618,142

ARTICLE OF PERSONAL WEAR AND ADORNMENT SIMULATING A POCKET HANDKERCHIEF AND METHOD OF MAKING IT

Rudolph H. Bruni, 2024 Park Ave. 23220, and Frances B. Gillie, 4806 Suecia Drive 23231, both of Richmond, Va.

Filed Jan. 15, 1970, Ser. No. 3,091
Int. Cl. A41b *15/00*
U.S. Cl. 2—279 7 Claims



An article simulating a pocket handkerchief for wear in the breast pocket of a coat, and the method of making it. The top corners of three rectangular sections of decorative fabric, are first individually folded to form central peaks and the folds are temporarily secured at and along their overlapping coincident transverse edges. Then the side edges of a center one of the sections thus formed are stitched respectively to a side edge each of the two end sections, to form a unitary flat main portion. A rectangular one-piece fabric lining of about the same size as the main portion, is stitched along one side edge to the main portion, along a line determined by the aforesaid overlapping transverse edges. The stitching thus formed does not pass through the main part of the several sections and does not appear in the completed article. The united main portion and lining are then folded along a vertical line through the tip of the central section, with the "wrong" surfaces of these parts facing outwardly, and the vertical superposed side edges are stitched together to form a side seam which is trimmed. The tubular item thus formed is then turned inside out so that the "right" surface of the lining is outward. Next, the tubular item is adjusted so that the aforesaid side seam is superposed over a vertical line through the tip of the center section, then flattened and stitched transversely along and through the bottom edges. The article is completed by turning it inside out thus exposing the "right" side of the main portion. As worn, the center section faces forwardly and is flanked by parts of the two side sections and with all three peaked portions exposed. All stitches are concealed. A rectangular piece of stiffening material may be used inside the finished article, which may be made of silk sections and lining of the same or different patterns and colors. When worn as intended, the invention presents an extremely neat, attractive and pleasing appearance.

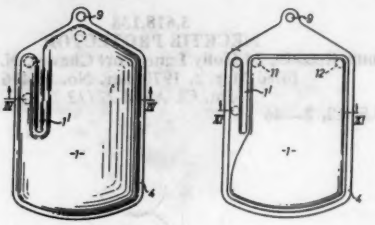
3,618,143

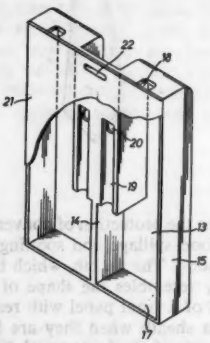
DISPENSING CONTAINERS

Ronald Poppleton Hill, Willerby, Harry Hodds, Hull, and John Michael Fulks Braddock, Ham, Richmond, England, assignors to Reckitt & Colman Products Limited, Hull, England

Filed May 9, 1969, Ser. No. 823,438
Claims priority, application Great Britain, May 29, 1968, 25,821/68
Int. Cl. E03d *9/02, 9/03*
U.S. Cl. 4—228 3 Claims

A container for water dispersable treatment material for use in flushable water cisterns comprising two members, each with its marginal edge in a common plane and at least one of which is shaped to form part of a hollow body, joined edge-to-edge to form a main compartment divided into an adjacent elongated compartment open at its operative lower end to the main compartment a port opening into the main compartment at its uppermost point in operative position of the container, and at least one port opening into the elongated compartment at a point





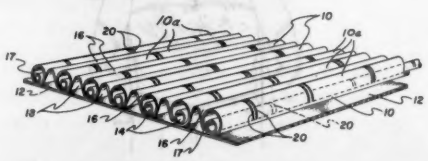
lower than and spaced a vertical distance from said first mentioned port in said operative position, in arrangement such that when placed in a water cistern water may enter and fill the container and then on emptying the cistern there will be a discharge of water and dispersable material through the lower port on uncovering of the uppermost port.

3,618,144

CUSHIONING ASSEMBLY

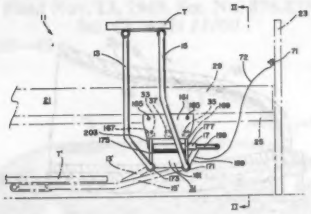
George C. Frey, Manhattan Beach, and Thaddeus W. Staniec and Charles M. Willis, Los Angeles, Calif., assignors to North American Rockwell Corporation

Filed Mar. 6, 1969, Ser. No. 804,864
Int. Cl. A47c *23/02*
U.S. Cl. 5—247 18 Claims



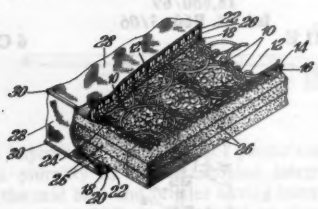
A pad for use in cushions, mattresses chairs, or other padding arrangements, providing a soft, deformable support, having one or more layers of parallel flexible tubes; each elongated tube being partially cut or slit across the axis of the tube for controlling resiliency and flexibility. The tubes are held in mutually spaced relationship by being affixed to a sheet of flexible material.

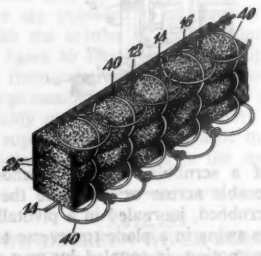
3,618,145
POWERED TABLE FOR HOSPITAL BED
James M. Rowe, Rte. 1, Newcastle, Box 56–C, Forrest City, Ark. 72335
Filed July 10, 1970, Ser. No. 53,866
Int. Cl. A47b *23/00*
U.S. Cl. 5—332 10 Claims



An electrically powered hydraulically driven retractable table. A table intended to be mounted on a hospital bed and is constructed so the patient, presumably being physically unable to ambulate, may easily stow the table or return it to a usable position. The table surface is constantly maintained in a horizontal position, i.e., in a usable position, in a stowed position, and when traveling from one position to the other.

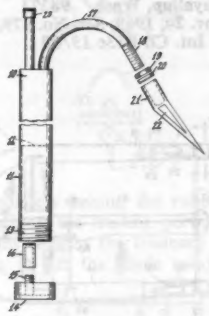
3,618,146
BORDER STABILIZER
Robert M. Ferdinand, New York, N.Y., assignor to The United States Bedding Company, Englander Division, St. Paul, Minn.
Filed Apr. 24, 1969, Ser. No. 818,925
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—351 15 Claims





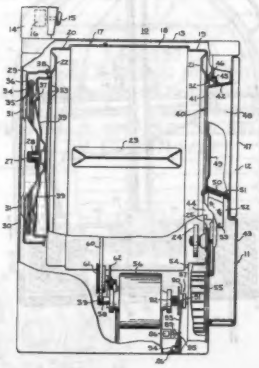
A border stabilizer for inner spring mattresses, cushions, etc. is provided in a resilient foam strip inserted between adjacent convolutions of each of the coils in a peripheral row of coils in the spring assembly.

3,618,147
MULTIPURPOSE BOAT-FISHING IMPLEMENT
Richard L. Gaskill, 220 Chestnut, Runnemede, N.J. 08078
Filed May 26, 1970, Ser. No. 40,613
Int. Cl. B25f *1/00*; B65g *7/12*
U.S. Cl. 7—1 H 7 Claims



The implement is a combination boat-hook and fishing gaff comprising a pole having a threaded hollow handle at one extremity and at least a crook provided with a threaded end at the other extremity for mounting a selected one of a plurality of appliances including one with a blunt tip, when the implement is used as a boat-hook, and one with a pointed tip, when the implement is used as a fishing gaff. A cap, used to close the hollow extremity of the pole, has at least one threaded stud on which to mount a non-selected appliance for storage within the hollow pole handle.

3,618,148
HEAT SHRINK METHOD OF FACILITATING THE DISPOSAL OF TRANSFER AGENT
Laddie A. De Pas, Louisville, Ky., assignor to General Electric Company
Filed Nov. 24, 1969, Ser. No. 879,032
Int. Cl. D06l *1/08*; D06f *35/00*
U.S. Cl. 8—158 3 Claims



In connection with a method of cleaning soil from fabrics by tumbling together the fabrics, a quantity of liquid and a quantity of transfer agent and subsequently separating the soiled transfer agent from the fabrics, an improved method is provided to facilitate the disposal of

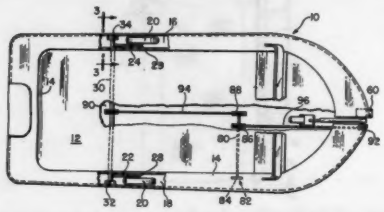
the transfer agent whereby the soiled segregated transfer agent is heat shrunk to reduce its volume and to cause at least partial adherence between at least some of the pieces of transfer agent.

3,618,149

PLEASURE BOAT WITH RETRACTABLE WHEELS

Arnold E. Christensen, 6818 Bentley Road, Puyallup, Wash. 98371

Filed Nov. 24, 1969, Ser. No. 879,303
Int. Cl. B63c 13/00
U.S. Cl. 9—1 T 4 Claims



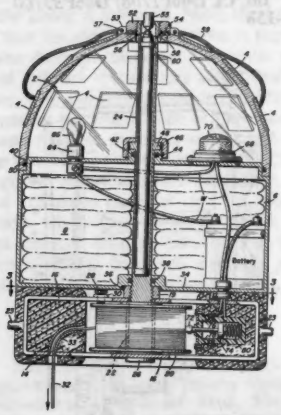
A boat having integral rear wheels for transporting the boat on land with a tow vehicle is disclosed. The rear wheels are retractable out of sight when the boat is water borne. The boat also has a bow wheel used in conjunction with the two rear wheels for transporting the boat into and out of the water once disconnected from the tow vehicle. Means is provided for retracting the rear wheels and bow wheel from a single position within the boat.

3,618,150

BEACON BUOY MARKER CONTAINING LIFE-SAVING AND SIGNALING DEVICES

James V. Anselmi, 16 Essex St., Deep River, Conn. 06417

Filed Mar. 4, 1969, Ser. No. 804,085
Int. Cl. B63b 21/52
U.S. Cl. 9—8.3 E 4 Claims



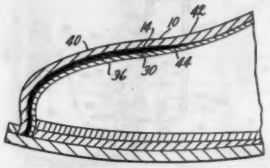
A buoy for marking the location of a sunken craft. The buoy contains lifesaving and signaling equipment. An automatically inflatable raft can be removed by a survivor and a blinking light is turned on during the twilight and nighttime to signal a rescuer. A number of light reflecting plates reflect sunlight during the daytime to produce a daytime signaling device.

3,618,151

METHODS OF STIFFENING A SHOE COMPONENT

Karl V. Becker, Boxford, Mass., assignor to USM Corporation, Boston, Mass.

Continuation-in-part of application Ser. No. 867,642, Oct. 30, 1969. This application Sept. 15, 1970, Ser. No. 72,410
Int. Cl. A43d
U.S. Cl. 12—146 D 10 Claims



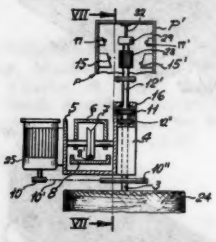
The method of stiffening a selected area of a shoe component in which an open fabric of interwoven threads is assembled with the area to be stiffened, molten synthetic polymeric material is flowed around the threads, through openings between the threads and into wetting engagement with the area to be stiffened of the shoe component and the polymeric material is cooled to form a cellular layer of hardened polymeric material in which the cells are the spaces kept free from polymeric material by the threads. A liner may be pressed into adhesive engagement with the polymeric material in heated tacky condition at the free surface of the open fabric.

3,618,152

DRIVING MECHANISM FOR SCRUBBING BRUSHES OF VEHICLE-WASHING STATIONS

Uberto Capra, Vicenza, Italy, assignor to Ceccato & C. S.p.A., Vicenza, Italy

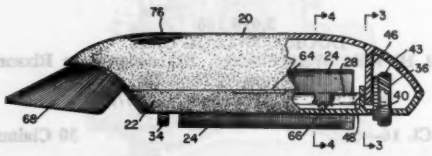
Continuation-in-part of applications Ser. No. 814,261, Apr. 8, 1969, and Ser. No. 874,355, Nov. 5, 1969. This application June 29, 1970, Ser. No. 50,751
Claims priority, application Italy, June 28, 1969, 18,880/69
Int. Cl. B60s 3/06
U.S. Cl. 15—21 E 6 Claims



The shaft of a scrubbing brush suspended from a carriage displaceable across or alongside the path of a vehicle to be scrubbed, journaled in a pivotally mounted housing so as to swing in a plane transverse to the direction of carriage motion, is coupled by way of a speed-reversing transmission with a knurled roller mounted on another shaft journaled in the same housing, this roller co-operating with a friction surface parallel to the carriage track to move the carriage in a predetermined direction on being urged against that surface by a thrust exerted upon the brush as it contacts the vehicle. Owing to the interposition of the speed-reversing transmission,

the carriage motion is codirectional with the peripheral motion at its point of contact with the vehicular surface to be scrubbed, with resultant intensification of the cleaning action.

3,618,153
HAND-HELD LITTER-COLLECTING DEVICE WITH COOPERATING FIXED AND ROTATED BRUSHES
John H. Coult, 1 Leland Road, Natick, Mass. 01760
Filed Nov. 13, 1969, Ser. No. 876,235
Int. Cl. A47l *11/00*
U.S. Cl. 15—41 **20 Claims**



This disclosure depicts a litter collecting device having a fixed brush extending from an end of a housing therefor adapted for cooperation with a cylindrical brush mounted within the housing and driven by a friction drive train. The device is configured to nest comfortably in the open grip of a user's hand and embodies a number of novel structures.

3,618,154
BRUSH
Joseph C. Muhler, Indianapolis, Ind., and Paul C. Clark and James A. Ford, Sturgis, Mich., assignors to Indiana University Foundation, Bloomington, Ind., and Plastek Company, Sturgis, Mich., fractional part interest to each
Filed Feb. 2, 1970, Ser. No. 7,891
Int. Cl. A46b *15/00*
U.S. Cl. 15—167 **8 Claims**

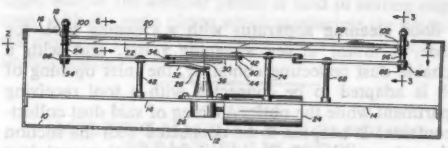
An improved brush formed of plastic comprises a base and a plurality of bristles molded integrally with the base, the said base and bristles having incorporated therein up to about 30% by weight of an abrasive material. The bristles are provided in a plurality of cylindrical clusters, with the bristles in each cluster being tapered from wide bases to relatively narrow tips. By tapering the bristles from relatively wide bases to relatively narrow tips, large numbers of such integrally molded brushes can be reliably manufactured in a short period of time due to the superior metering of plastic material into the tapered bristle-forming cavities in the mold.

3,618,155
WINDSCREEN WIPER BLADES
Peter Mower, Whitton, Twickenham, England, assignor to Trico Products Corporation, Buffalo, N.Y.
Filed June 20, 1969, Ser. No. 835,123
Claims priority, application Great Britain, June 21, 1968, 29,700/68
Int. Cl. B60s *1/32*
U.S. Cl. 15—250.42 **2 Claims**

A windscreen wiper blade having a longitudinal slot separating the leading portion of the blade harness from the trailing portion. The trailing edge of the leading portion extends outwardly from the blade edge a greater distance than the leading edge of the trailing portion. Thus the airstream flowing over the windscreen is deflected so that a portion of the airstream is directed into

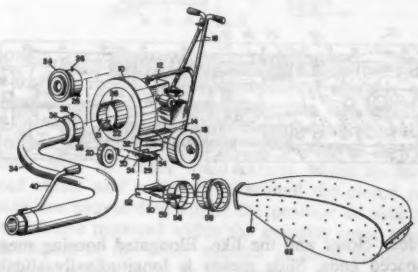
a space immediately behind the rubber and turbulence in the area behind the trailing portion of the blade is minimized. This reduces the tendency occurring at high vehicle speeds to lift the blade away from the windscreen.

3,618,156
POWER WIPER FOR REAR VIEW MIRRORS
Ben L. Riggs, Rte. 2, Box 87–B, Chandler, Ariz. 85224
Filed Aug. 17, 1970, Ser. No. 64,214
Int. Cl. B60s *1/44*
U.S. Cl. 15—250.29 **5 Claims**



A power wiper for rear view mirrors in which a wiper blade operates in rectilinear and oscillatory motion over the surface of a substantially rectangular mirror and the wiper blade is actuated by a motor having a shaft continuously rotatable in one direction; lever arms and bearings are operable by said motor shaft and coupled to opposite ends of the wiper blade for creating oscillatory action thereof relative to the surface of the mirror.

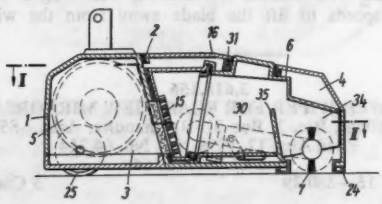
3,618,157
YARD CLEANING MACHINE
Charles S. Bassin, 87 Primrose Drive, Longmeadow, Mass. 01106
Filed Dec. 8, 1969, Ser. No. 882,929
Int. Cl. A47l *5/14*
U.S. Cl. 15—330 **1 Claim**



A blower apparatus for maintaining lawn and related areas which is convertible to a vacuum apparatus by the

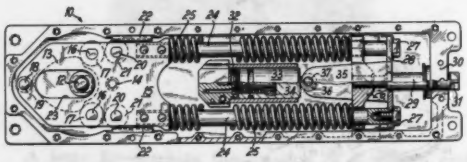
substitution of a hose or a vacuum snout for a protective cover at the air inlet of the fan housing and by the connection of a refuse collection bag or transfer hose at the air outlet of the fan housing, the fan or blower housing being rotatable about the impeller axis so as to locate the air outlet in any desired position of rotative adjustment.

3,618,158
FLOOR CLEANING APPARATUS
Peter Wörwag, Stuttgart, Germany, assignor to Progress-Elektrogerate Mauz & Pfeiffer, Stuttgart-Botnang, Germany
Filed June 8, 1970, Ser. No. 44,408
Claims priority, application Germany, June 6, 1969, P 19 28 713.9
Int. Cl. A47l 5/32
U.S. Cl. 15—332 **17 Claims**



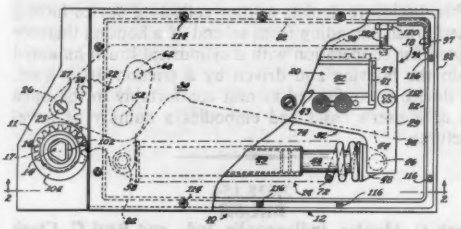
A floor cleaning apparatus with a cleaning tool, for instance, a motor driven sweeping roller, and with a detachable dust collecting container, the inlet opening of which is adapted to be connected with a tool receiving compartment while the outlet opening of said dust collecting container is adapted to be connected with the suction opening of a suction device, the dust collecting container for collecting sweep-up dust and the suction dust collecting container being interchangeable while the inlet opening of said suction dust collecting container forms an opening for receiving a suction hose or the like, said suction dust collecting container being closed with regard to the apparatus compartment containing the tool.

3,618,159
DEVICE FOR CLOSING DOORS AND THE LIKE
Dietrich Jentsch, Ennepetal-Voerde, Germany, assignor to Firma Dorkin & Mankel KG, Ennepetal-Voerde, Germany
Filed Sept. 11, 1969, Ser. No. 856,975
Claims priority, application Germany, Sept. 13, 1968, P 17 84 743.7
Int. Cl. E05f 3/22
U.S. Cl. 16—55 **9 Claims**



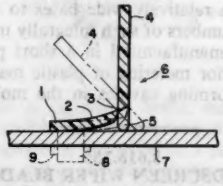
A door closer and the like. Elongated housing means has spaced ends. Slide means is longitudinally slidable in the housing in the region of one of the ends between an operative and an inoperative position. Shaft means is connected with the slide means and can be connected with a door so as to move the slide means to its operative position when the door is opened. A pair of transversely spaced rods are coupled to the slide means for movement with the same and extend towards the other end of the housing. Biasing spring means permanently urges the slide means to its inoperative position. A cross-head is mounted on the ends of the shafts adjacent the other end for movement with the shafts. A dashpot having a stationary and a movable component is mounted intermediate the shaft for damping movement of the slide member to its inoperative position. Connecting means connects the cross-head with the movable component of the dashpot.

3,618,160
DOOR CONTROL UNIT
David H. Ellis, West Chicago, Ill., assignor to Rixson Inc., Franklin Park, Ill.
Filed Oct. 16, 1969, Ser. No. 867,031
Int. Cl. E05f 3/20
U.S. Cl. 16—55 **30 Claims**



A door control unit adapted for installation in shallow floors or frames and wherein a cartridge comprising a hydraulic door checking mechanism, a driven member and a spring actuator may be removed from the housing of the door control unit without removing the door from the spindle.

3,618,161
HINGE MECHANISM WITH SPRING ACTION
Takamitu Nozawa, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
Filed Apr. 29, 1969, Ser. No. 820,245
Claims priority, application Japan, Sept. 25, 1968, 43/69,657
Int. Cl. E05d 7/00
U.S. Cl. 16—150 **3 Claims**

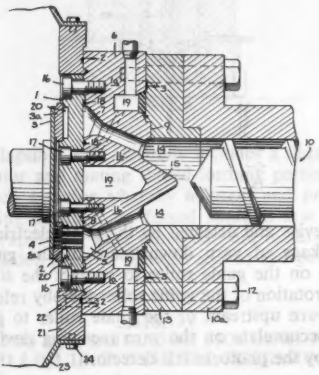


A hinge mechanism consisting of a flexible and resilient member of two main portions which are connected through a thin boundary layer with a first of said portions projecting toward the second beyond the boundary layer line so that when the edge of the second is attached to a base member and the first portion is swung upwardly, the projection biases the first portion open.

3,618,162
PLASTIC PELLETIZER UNDERWATER PELLETIZING HEAD

Hans R. Scharer, Wallingford, and Donald C. Chase, Orange, Conn., assignors to USM Corporation, Boston, Mass.

Filed Oct. 2, 1969, Ser. No. 863,151
Int. Cl. B29f *3/02, 3/04, 3/08*
U.S. Cl. 18—1 B 9 Claims

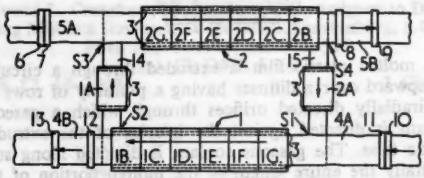


A plastic pelletizer underwater pelletizing head has a pellet plate support constructed to support the pellet plate against bending under the force of the plastic, by providing for screwing the pellet plate to the support by screws arranged on the inside of the pellet plate's annular series of plastic extrusion holes as well as on the outside of this series of holes, and constructed to shield the pellet plate from plastic pressure throughout its generally central area.

3,618,163
APPPARATUS FOR CURING ELONGATED ARTICLES

Hugh Lorain Folkes, St. Leonard's-on-Sea, England, assignor to Dunlop Holdings Limited, Birmingham, England

Original application Nov. 4, 1966, Ser. No. 592,131. Divided and this application Aug. 5, 1969, Ser. No. 862,568
Claims priority, application Great Britain, Nov. 10, 1965, 47,594/65
Int. Cl. B29c *3/02*; B29h *5/20*; B29b *5/22*
U.S. Cl. 18—2 F 15 Claims

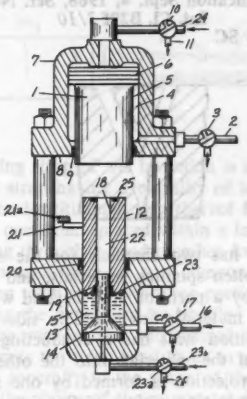


A curing press for elongated articles having a series of press units which successively engage successive portions of the article and move it and a unit of the press while they are in engagement through the press while the press units apply compressive force and heat to successive portions of the article. The article and the press units in engagement therewith are moved through the press in a stepwise manner and each portion of the article has compressive force applied to it while it is stationary.

3,618,164
ISOSTATIC PRESS

Norman Rietmann, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed May 25, 1970, Ser. No. 40,290
Int. Cl. B30b *5/00, 11/00*
U.S. Cl. 18—5 H 10 Claims

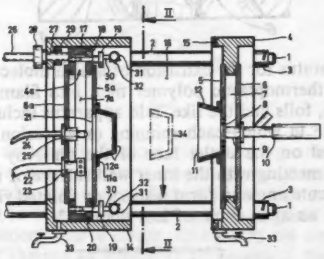


A hydraulic press in which the pressure chamber for isostatic molds and liquid comprises an annular piston having its lower end telescoped over a stationary piston. The upper end of the annular piston is held in sealing engagement with the main piston which pressurizes the liquid and the molds by forcing the annular piston down over the stationary piston.

3,618,165
MOLDING MACHINE FOR HANDLING EXPANDIBLE PLASTICS

Hans Ulrich Hauser-Lienhard, Zurich, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Zurich, Switzerland

Filed Feb. 25, 1969, Ser. No. 802,017
Claims priority, application Switzerland, Mar. 19, 1968, 4,037/68
Int. Cl. B29d *27/00*
U.S. Cl. 18—5 P 4 Claims



A molding machine for handling expandible plastics and forming molded articles comprises a movable and a fixed mold carrier frame each carrying one mold half. The movable mold carrier frame is mounted within a movable cover member which can be moved in sealing contact with the other mold carrier frame to form a closed steam and water space around the closed mold. Means are provided to adjust the position of said mold carrier frame mounted within the movable cover member with respect to the cover member in mold opening and closing direction, so as to compensate the varying constructional height of different molds to be used in the machine.

3,618,166
SPINNERETS FOR THE MANUFACTURE OF COMPOSITE FIBER FILAMENTS
Satoshi Ando and Yusaku Tanaka, Osaka-shi, and Fumimaro Ogata, Nishinomiya-shi, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
Original application Sept. 27, 1965, Ser. No. 490,448, now Patent No. 3,458,390, dated July 29, 1969. Divided and this application Sept. 4, 1968, Ser. No. 770,881
Int. Cl. B29f *3/10*
U.S. Cl. 18—8 SC 2 Claims

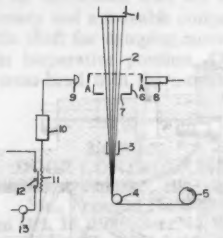
A spinneret has two channels for the separate conveyance of molten spinning materials, and the channels are separated by a partition wall beyond which the separate spinning materials are joined in side by side relation. The partition wall has a conducting passage for entry of one of the materials into the other so that an interengaged projection is formed by one material into the other at the joining surface of the materials.

3,618,167
APPARATUS FOR THE MELT EXTRUSION OF LINEAR FIBER-FORMING OR FILM-FORMING THERMOPLASTIC POLYMERS
Hans-Joachim à Brassard and Heinz-Josef Jütten, Oberbruch, Germany, assignors to Glanzstoff AG, Wuppertal, Germany
Filed Feb. 28, 1969, Ser. No. 803,300
Claims priority, application Germany, Mar. 2, 1968, P 17 10 621.7
Int. Cl. D01d *3/00*
U.S. Cl. 18—855 8 Claims

Apparatus for the extrusion of a high molecular weight, linear, thermoplastic polymer melt into filaments, yarns, ribbons, foils and the like, said apparatus including a nozzle plate in which each spinning or extrusion aperture is encircled on the outlet face of the plate by a reentrant groove meeting with the inner wall surface of the aperture at an acute angle to form a sharp or pointed ridge, preferably at an apex angle of less than 45°.

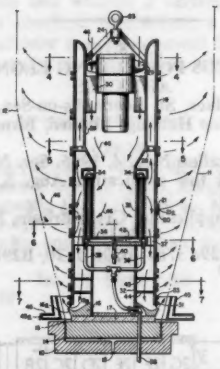
3,618,168
APPARATUS FOR DETECTING BROKEN YARN IN SYNTHETIC FIBER SPINNING
Eitaro Mukai, Yasuhiro Murase, Mitsuru Kusama, Misturu Yamasaki, Takayuki Takasago, and Tatsumi Tanabe, Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Apr. 1, 1969, Ser. No. 811,979
Claims priority, application Japan, Apr. 9, 1968, 43/23,858
Int. Cl. D01d *7/00*
U.S. Cl. 18—8 R 2 Claims

Apparatus for detecting breakage of continuous filament yarn including a yarn receiving device disposed between a spinneret and a guide roller, and a photoelectric detector disposed adjacent the yarn receiving device to detect yarn accumulated thereon. The guide roller has a stopper rod extending from a flange to stop rotation of the guide roller when yarn builds up on the guide roller to contact the stopper rod. Broken yarn upstream of the guide of the guide roller is accumulated on the yarn re-



ceiving device and detected by the photoelectric detector, and breakage of yarn downstream of the guide roller builds up on the guide roller to contact the stopper rod and stop rotation of the guide roller thereby releasing tension on yarn upstream of the guide roller to permit the yarn to accumulate on the yarn receiving device and be detected by the photoelectric detector.

3,618,169
MANUFACTURE OF PLASTIC FILM
John B. Coast, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,693
Int. Cl. B29d *7/04, 7/24*
U.S. Cl. 18—14 A 12 Claims

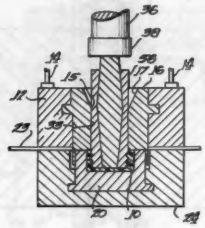


A molten plastic film is extruded through a circular die upward over a diffuser having a plurality of rows of omniradially directed orifices through which a gaseous coolant is directed against the interior of the extruded plastic tube. The gaseous coolant is directed along substantially the entire length of the molten portion of the extruded tube.

3,618,170
APPARATUS FOR MOLDING PLASTIC CLOSURES
Edward W. Owens, Palatine, Ill.
(4702 Valley Ridge Court, Toledo, Ohio 43614)
Filed July 14, 1969, Ser. No. 841,208
Int. Cl. B29c *11/00;* B29d *1/00;* B29f *1/14*
U.S. Cl. 18—30 WM 8 Claims

In a method for pressure molding plastic materials, a strip of deformable plastic is extruded over a mold cavity. A predetermined piece of the extrudate is cut from the

strip and formed in the mold under pressure by means of a collapsible core and bushing assembly which forms the plastic at relatively low pressure in conjunction with the forming surface of a mold cavity.



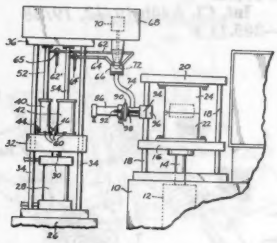
The collapsible core assembly includes a slidably movable actuator and mating thread-forming portions which engage such actuator whereby adjacent end portions of said forming portions are forced apart at first end portions, and approach each other and are readily released from a molded piece at opposed second end portions.

3,618,171

APPARATUS FOR INJECTION MOLDING PROPORTIONED LIQUID SYNTHETIC THERMOSETTING RESINS

Robert F. Zecher, Huntingdon Valley, Pa., assignor to Hull Corporation, Hatboro, Pa.

Filed Aug. 5, 1969, Ser. No. 847,677
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 AR **1 Claim**



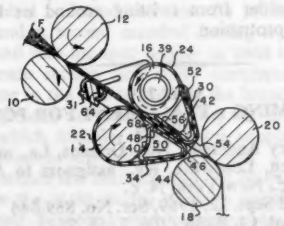
Liquid synthetic thermosetting resin and hardener are metered separately in predetermined proportions to a mixer for intimate blending and then immediate injection into a mold.

3,618,172

DRAFTING CRADLE

Edward L. Crenshaw, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 5, 1970, Ser. No. 546
Int. Cl. D01h *5/60*
U.S. Cl. 19—245 **2 Claims**



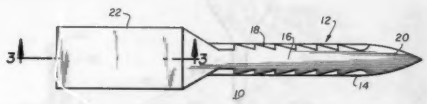
A drafting cradle with an apron supporting surface which has an opening therein to allow fibers trapped under the apron to be readily removed.

3,618,173

BUNDLING STRAP

Richard S. Schwartz, Union Township, Union County, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Apr. 10, 1970, Ser. No. 27,372
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **14 Claims**



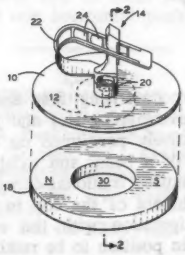
The bundling strap of the invention is an incrementally adjustable strap having a plurality of teeth positioned in at least one longitudinal edge thereof for engagement with at least one detent placed within a longitudinal passage extending through a head member formed as a portion of the overall strap. A two component strap body portion having teeth in an overlying portion is prevented from touching the articles to be bundled by the protective underlying portion. The longitudinal passage through the head permits the strap head to lie in close contact to and conform generally to the shape of the articles to be bundled. By the choice of the number and positioning of the detents placed within the head member, the number of incremental positions at which the strap may be locked may be greatly increased.

3,618,174

MAGNETIC FASTENER

Herbert Schainholz, 316 Locust St., Teaneck, N.J. 07666, and Peter Katz, 18 Locust Place, Livingston, N.J. 07039

Filed Feb. 4, 1970, Ser. No. 8,655
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 **2 Claims**



A quick detachable fastener for attaching articles to sheet material has an annular ring magnet and armature with a centrally disposed guide post for mating with the annular ring to maintain the armature and magnet ring in proper alignment, and a clamp attached to the armature for securing thereto an article to be mounted, the sheet material being held between the armature and magnet by the magnetic attraction therebetween.

3,618,175

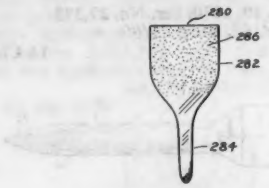
VISUAL AID

Charles H. Lindberg, 2038 NE. 123rd, Seattle, Wash. 98125

Continuation-in-part of application Ser. No. 571,367, Aug. 8, 1966. This application Dec. 23, 1968, Ser. No. 786,336
Int. Cl. A44b *21/00, 19/00*
U.S. Cl. 24—73 R **4 Claims**

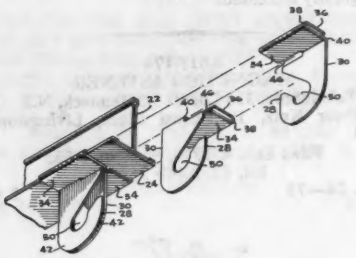
This invention relates to an inexpensive, easily handled and easily stored visual aid which can be used to give a

three dimensional appearance. The invention comprises a mesh and upright supports for supporting the mesh. Also,



there is a flexible tab to assist in positioning a picture or an object in front of or back of the mesh to assist in giving the three dimensional effect.

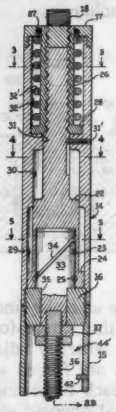
3,618,176
HANGER CLIP
Cedric L. Barnes, 2753 Fort Scott Drive, Arlington, Va. 22202
Filed Oct. 1, 1970, Ser. No. 77,200
Int. Cl. A44b *13/00;* **E04b** *5/52;* **B42f** *13/00*
U.S. Cl. 24—84 **9 Claims**



A hanger clip comprising first and second mating portions having overlapping slot and plate components which are respectively positioned on opposite sides of the lower flange of a beam and axially moved toward each other for abutting frictional engagement to provide a resultant attachment of the clip to the beam purely by manual manipulation with the components being frictionally held in position to be retained on the beam.

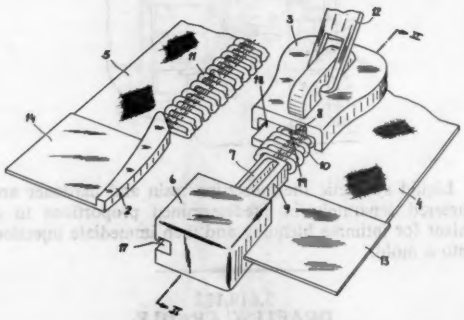
3,618,177
CABLE RELEASE MECHANISM
Richard G. Wood, 3665 E. County Road, Apt. 5, Odessa, Tex. 79760
Filed Aug. 24, 1970, Ser. No. 66,349
Int. Cl. E21b *31/00*
U.S. Cl. 24—201 R **10 Claims**

A mechanism for releasably supporting objects which are vertically disposed therefrom, comprising a housing from which there depends a plunger and a releasably coupling. The mechanism is supported by the plunger while the lower extremity of the coupling engages the object which is to be releasably supported. The plunger is connected to a mandrel by a grooved cam which cooperates with a pair of steel balls in a manner to convert reciprocal rectilinear motion of the plunger into intermittent rotational motion so as to cause rotation of the mandrel which in turn is unscrewed from the coupling. Interposed between the mandrel and the grooved cam is a second grooved cam which is engaged by a pin in a manner to produce an extremely high initial torque after several ini-



tial cycles of reciprocating rectilinear motion is imparted into the plunger.

3,618,178
SEPARABLE SLIDE FASTENER
Harry Hansen, Copenhagen-Valby, Denmark, assignor to Lysta A/S, Copenhagen-Valby, Denmark
Continuation-in-part of application Ser. No. 730,409, May 20, 1968. This application May 22, 1970, Ser. No. 39,629
Int. Cl. A44b *19/12, 19/38*
U.S. Cl. 24—205.11 F **7 Claims**

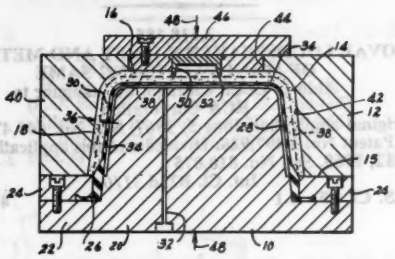


A separable slide fastener has at its starting end an insert block with a ribbed protrusion which snugly mates with a grooved passage in a slider to hold the two relative to each other in an ideal aligned fastening position. The protrusion extends about halfway into the slider and prevents this slider from twisting around or becoming cocked on the protrusion.

3,618,179
HOLE-FORMING ATTACHMENT FOR POWDER PRESS
Warren Gregory Anderson, New Orleans, La., and Curtis Wayne Ogren, Louisville, Ky., assignors to American Standard Inc., New York, N.Y.
Filed Sept. 22, 1969, Ser. No. 859,846
Int. Cl. B28b *7/06, 7/18, 7/32*
U.S. Cl. 25—27 **5 Claims**

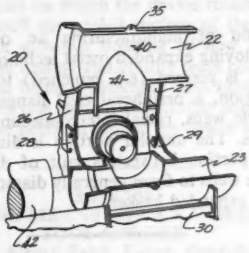
An isostatic powder press for forming toilet tanks or other articles having holes formed therethrough. One of

the die mechanisms in the press is provided with an annular sleeve which moves into the powder during the compaction stroke to entrap the powder and form a hole



through the finished article. The hole is formed without stressing the compacted article, thus minimizing the tendency for cracks to occur adjacent the hole during the glazing and firing periods.

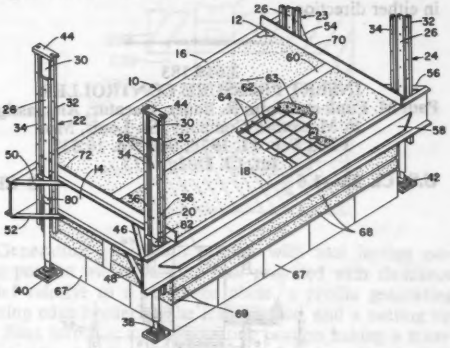
3,618,180
APPARATUS FOR MAKING BRANCHED CONDUITS
John F. Rogers, Morehead, Ky., assignor to Lee Clay Products Company, Clearfield, Ky.
Original application Nov. 28, 1967, Ser. No. 686,156, now Patent No. 3,499,067, dated Mar. 3, 1970. Divided and this application July 18, 1969, Ser. No. 870,987
Int. Cl. B28b 21/42
U.S. Cl. 25—30 R **4 Claims**



A method of manufacturing a branched tubular conduit having connecting passageways from a plurality of tubular sections of plastic material which includes pressure welding an end of one tubular section to a side of a second tubular section and simultaneously forming an opening in the side between the section hollows. A length of uncured clay pipe is extruded, an end of the length is cut off to form a main section and a spur section and the spur end is configurated to the main section side. The sections are then aligned in a supporting mold having an inner wall defining a tubular surface which is laterally intersected by another tubular surface for supporting the configurated spur end adjacent the main section side. A first mandrel is introduced into the hollow of the main section and a second mandrel having a cutting edge is then forced into the spur section to weld the spur section to the main section side while simultaneously forming an opening in the side to provide the branched conduit.

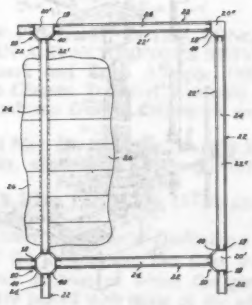
An apparatus for manufacturing the branched tubular conduit which includes a mold for supporting the main section adjacent the spur section end, a mandrel positionable within the main section for supporting the main section in the mold during pressure welding of the spur thereto and a second mandrel movable into the mold for pressure welding the spur section to the main section side while simultaneously forming an opening in the side between the section hollows.

3,618,181
METHOD AND APPARATUS FOR CASTING CONCRETE AND OTHER SETTABLE MATERIALS
Martin E. Veale, 1719 W. Cameron, Tulsa, Okla. 74127
Filed Mar. 25, 1969, Ser. No. 810,208
Int. Cl. B28b 7/22
U.S. Cl. 25—41 K **2 Claims**



A method and apparatus are provided by which concrete or similar castable material can be formed in a vertical stack using a single frame. The initial slab or form is poured onto a platform with or without re-enforcing steel lying thereon. When the initial slab has been poured within the surrounding frame or mold and at least partially set, the frame is elevated a predetermined distance, a suitable bond breaking agent such as, for example, a cardboard sheet, having the approximate dimensions of the previous slab, is placed over the top of the latter, re-enforcing steel placed thereon and the concrete pouring step repeated. The freshly poured concrete is smoothed out by the use of vibrators, trowels and leveling bars. The casting frame may be so constructed as to form two or more molded forms while said frame is at one horizontal position.

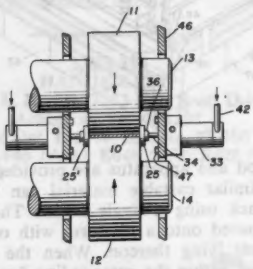
3,618,182
MEANS FOR PRODUCING CONCRETE FRAMEWORKS FOR BUILDINGS
Raymond A. Burkland, 225 Beechwood Ave., Trenton, N.J. 08618
Continuation-in-part of application Ser. No. 655,129, July 21, 1967. This application Mar. 12, 1969, Ser. No. 815,514
Int. Cl. B28b 7/06
U.S. Cl. 25—131 A **10 Claims**



A configurative arrangement of vertically self-propelled concrete molding units for concurrently molding all the concrete columns and lateral connecting beams or floors

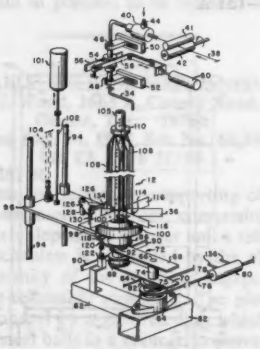
of a building framework and then successively molding the concrete floors beginning with the top floor, or the bottom floor; the molding units having means for impressing horizntal corrugations or indentations in the wet concrete of the columns, and motor driven means carried by one or all the molding units for engaging the indentations in the columns after hardening of the concrete for effecting coordinated vertical movement of all the molding units in either direction.

3,618,183
INSERT PRESSURE CONTROLLER
Paul M. Funk and John R. Bauer, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.
Filed Feb. 11, 1970, Ser. No. 10,532
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **3 Claims**



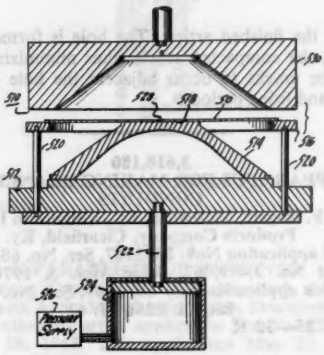
An apparatus for holding and adjusting the position of a wear disc in a stuffer box crimper. The apparatus maintains a bearing surface in contact with outer annular lateral-portions of a pair of crimping rolls, said apparatus including a disc member formed with a bearing surface thereon, means for urging said member into engagement with the lateral-portions of the rolls, and means for rotating the disc member about an axis running parallel to the nip of the rolls.

3,618,184
METHOD TO PRODUCE A HIGH BULK YARN PACKAGE
Larry N. Pearce and Grady H. Sanders, Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Nov. 18, 1968, Ser. No. 776,534
Int. Cl. D02g *1/00*; D06p *7/00*
U.S. Cl. 28—75 WT **3 Claims**



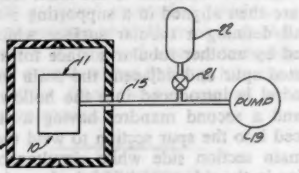
Method to produce a dyed yarn package with qualities similar to that of a skein dyed yarn package. The method incorporates a novel spindle onto which, preferably, high bulk yarns are wound under very little tension to provide a compact but loose yarn package which is amenable to efficient bulking and dyeing.

3,618,185
OVAL LOUDSPEAKER BASKET AND METHOD OF MANUFACTURING SAME
Aldo L. Coen, Chicago, Ill., assignor to RCA Corporation
Original application June 5, 1967, Ser. No. 643,473, now Patent No. 3,497,928. Divided and this application Feb. 12, 1969, Ser. No. 810,075
Int. Cl. B21d *31/04*
U.S. Cl. 29—6.1 **4 Claims**



A method of manufacturing an oval loudspeaker basket employing expanded metal techniques. A flat blank of material is pierced (e.g. punched) to form a central annular region, a peripheral oval flange and a network of concentric webs, radial interconnecting webs and concentric slots. The annular portion is displaced from the peripheral portion between a pair of die members, expanding the webs to form generally diamond-shaped openings in the expanded basket.

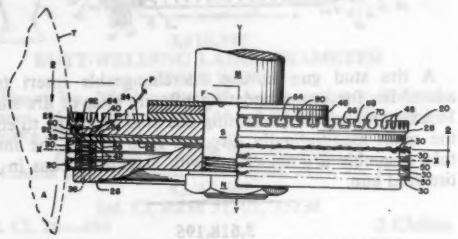
3,618,186
METHOD OF MAKING VACUUM CAPACITORS
Herman E. Krefft, Matawan, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 8, 1969, Ser. No. 855,956
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.41 **7 Claims**



The disclosure includes a method of processing a vacuum device such as a vacuum capacitor so as to increase its useful life under conditions of superimposed direct current, far beyond the present state of the art. Vacuum capacitors, when used as DC blocking capacitors in RF circuits, slowly degrade in voltage capability. The degradation becomes apparent when DC or DC plus RF voltages are applied to the capacitor. The present disclosure solves

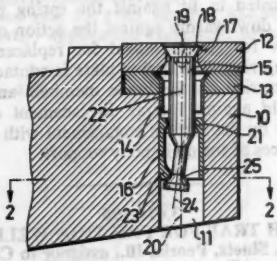
the degradation problem by applying an alternating voltage to the capacitor electrodes in the presence of an inert gas at low pressure and hermetically sealing the capacitor without the removal of adsorbed gas.

3,618,187
TIRE PEELING DEVICE
Wayne Emil Jensen, Homewood, Ill.
(P.O. Box 325, Glenwood, Ill. 60425)
Filed Mar. 13, 1969, Ser. No. 806,856
Int. Cl. B23d *71/00*; B26d *1/12*
U.S. Cl. 29—79 20 Claims



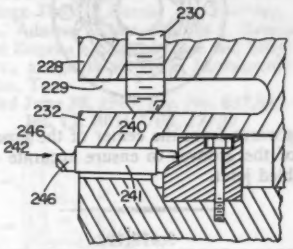
Tire peeling device having axially spaced rows of circumferentially spaced teeth about its periphery, the upper row comprising cutting teeth generally parallel to the axis on which the device rotates and having embossed and/or sharpened diverging side edges which with their outer edges peel the old rubber tread from a worn tire carcass as it is rotated thereagainst on an axis generally perpendicular to the axis on which the device rotates. The other rows of teeth buff the peeled surface of the tire carcass to a texture for effective bonding of new rubber tread thereto. Both the buffing and cutting teeth constitute sheet metal segmented blades removably held between annular plates, the upper one having an annular concave surface which directs the peeled tread off the device to a receiving waste container.

3,618,188
CLAMPING MEANS FOR AN INSERT IN A TOOL HOLDER
Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandviken Jernverks Aktiebolag, Sandviken, Sweden
Filed Nov. 28, 1969, Ser. No. 880,567
Claims priority, application Sweden, Nov. 29, 1968, 16,286/68
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 9 Claims



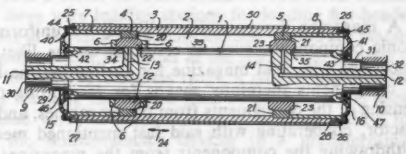
An insert is clamped in a tool holder by means of a pin rotatable in an aperture in the tool holder, which pin is, in part, eccentric with respect to the aperture and can be brought into contact with a fixed abutment so as to exert a lever action against the cutting insert.

3,618,189
GEAR MAKING
Alexander D. F. Moncrieff, Marion, Mass., assignor to Bird Island, Inc., Boston, Mass.
Filed July 28, 1969, Ser. No. 845,380
Int. Cl. B26d *1/00*, *1/12*
U.S. Cl. 29—103 9 Claims



Generating gear tooth profiles with tool having cutting portion with a leading face provided with clearance relief relative to a reference plane, a profile generating cutting edge bordering the leading face, and a cutting tip for fillet forming; and a mounting portion having a transverse axis parallel to a cutter axis when the tool is installed.

3,618,190
UNIFORM PRESSURE ROLLER FOR TEXTILE UTILIZATION
Julius Vernazza, Wahlheim, and Karl Grafen, Landgraben, Germany, assignors to H. Krantz, Aachen, Germany
Filed Oct. 31, 1969, Ser. No. 872,946
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 AD 4 Claims

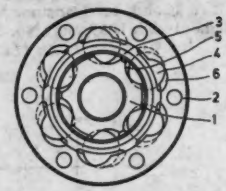


The disclosure describes a roller for exerting uniform pressure over the length thereof, particularly applicable to textiles, having a central core and a cylindrical shell enclosing the core, with an annular space separating the two. The shell is supported on the core by a two ring bearing assembly with spherical cooperating surfaces, one of said assemblies being movable on the core, while the other is secured against axial movement.

3,618,191
METHOD OF PRODUCING THE LONGITUDINAL GROOVES IN A SYNCHRONOUS SWIVEL JOINT
Walther Willimek and Erich Aucktor, Offenbach, and Sobhy Labib Girguis, Troisdorf, Germany, assignors to Lohr & Bromkamp GmbH, Offenbach am Main, Germany
Filed Nov. 20, 1969, Ser. No. 878,329
Claims priority, application Germany, Nov. 21, 1968, P 18 10 177.4
Int. Cl. B21h *1/12*; B23p *11/00*, *13/04*
U.S. Cl. 29—148.4 R 4 Claims

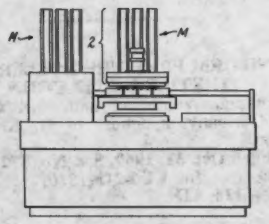
There is disclosed a process of producing a synchronous swivel joint of the kind having two joint members each with longitudinal grooves of which the grooves of one joint member are paired with those of the other member. In such a joint, balls are located in the pairs of grooves and transmit torque between the members and the members are axially displaceable so that the balls are displaced along the grooves towards the ends thereof. First

the grooves of the members are conventionally machined and hardened and then they are lapped over an area ex-



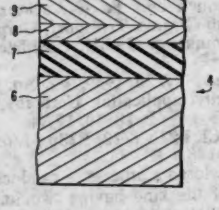
tending outwards from the center of the grooves towards the ends of the grooves to ensure accurate operation of the assembled joint.

3,618,192
UNIFORM COMPONENT RECEIVING AND DISPENSING MECHANISM
Fred H. Hoffken, Springfield, Pa., assignor to Essington Metal Works, Inc., Essington, Pa.
Filed Nov. 26, 1969, Ser. No. 880,244
Int. Cl. H01r *43/00*; B23g *7/10*
U.S. Cl. 29—203 B **14 Claims**



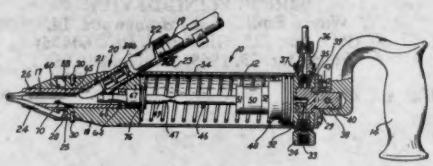
A magazine for receiving a supply of uniform, electronic components, such as resistors, or the like; means associated with said magazine for facilitating the loading of components thereinto; means for facilitating the dispensing of the components from the magazines; and an extractor, cooperating with said last mentioned means for withdrawing the components from the magazine, one at a time, and transferring them to a mechanism which inserts the components into a printed circuit board, for incorporating the components in selected circuits printed on said board.

3,618,193
GOLD-COATED REFLECTOR
Norman C. Anderson and James T. Gaspar, San Carlos, Calif., assignors to Varian Associates, Palo Alto, Calif.
Filed Jan. 8, 1969, Ser. No. 789,751
Int. Cl. B32b *15/04*; F21v *7/22*
U.S. Cl. 29—195 **9 Claims**



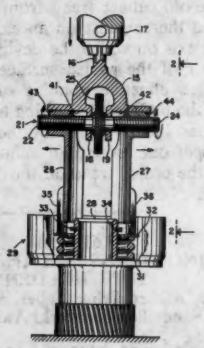
A gold-coated reflector comprising a metallic substrate, an oxide diffusion barrier overlaying said metallic substrate, a layer of refractory metal deposited on said diffusion barrier, and a layer of gold deposited on said layer of refractory metal.

3,618,194
TIRE STUD GUN
Gaylord B. Haviland, Maineville, Ohio, assignor to Big Four Automotive Equipment Corporation
Filed Feb. 24, 1969, Ser. No. 801,714
Int. Cl. B23q *7/10*
U.S. Cl. 29—212 T **6 Claims**



A tire stud gun having interchangeable insert tube assemblies for accommodating different sizes of tire studs. Indexing means for permitting one stud at a time to enter the main longitudinally disposed hole within the insert tube assembly are associated with actuator means in the tire stud gun.

3,618,195
CLUTCH DRUM SPRING COMPRESSOR
Hobson J. Elmore, Jr., 214 Ridgeway Drive, Gulfport, Miss. 39501, and William F. Elmore, 707 Windsor Drive, Birmingham, Ala. 35209
Filed June 20, 1969, Ser. No. 835,190
Int. Cl. B23p *19/04*
U.S. Cl. 29—227 **2 Claims**

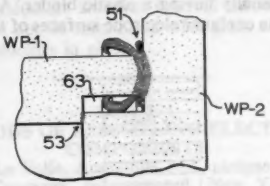


A clutch drum spring compressor adapted for use in assembling or disassembling automatic transmission parts formed of a supporting body adapted to be fitted into a drill press chuck and which has brace parts depending from a turn buckle assembly thereon and adapted to be laterally adjusted to fit against the spring plate that is to be forced downwardly against the action of the spring and to allow for easy removal for replacement of the snap retaining ring. The spring plate is contacted by four projections carried on the brace members and the brace members held against lateral displacement on the turn buckle screw by flat surface engagement with corresponding flat surfaces of the main body support.

3,618,196
FLASH TRAP FOR FRICTION WELDING
Edward J. Sluetz, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed July 7, 1969, Ser. No. 839,415
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **9 Claims**

A flash trap situated between a major weld and a minor weld produced between two weld members which are friction or inertia welded together. The trap com-

prises a radial void into which the flash from the major weld can expand. The opposite end of the void is closed

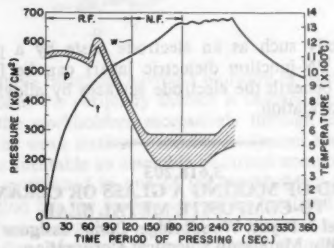


by the minor weld which is performed utilizing such parameters as to produce no flash therefrom.

3,618,197
BUTT-WELDING LARGE-DIAMETER STEEL BARS

Yoshinori Ito, Nishinomiya-shi, Japan, assignor to Sumitomo Metal Industries Ltd., Kitahama, Higashi-ku, Osaka, Japan

Filed Sept. 24, 1969, Ser. No. 860,771
Claims priority, application Japan, Sept. 25, 1968, 43/69,608
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 **2 Claims**

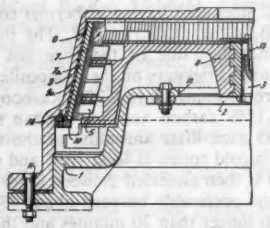


A process for butt-welding large-diameter steel bars having diameters of at least 30 mm., comprising the steps of applying a sufficient pressure to two pieces of a steel bar in abutting relationship for pressure welding, while heating the parts to be joined to the welding temperature with a sufficiently strong reducing hydrocarbon-oxygen flame for deposition of carbon on the steel surfaces, switching this reducinig flame over to a neutral flame, and then continuing the pressure application with a reduced pressure.

3,618,198
ASSEMBLY OF INTERFITTING ELEMENTS INCLUDING AT LEAST ONE HARD-TO-MACHINE PART

Ewald Schmeja, Dachau, and Walter Glomp, Lochham, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich-Allach, Germany

Filed May 13, 1969, Ser. No. 824,088
Claims priority, application Germany, May 16, 1968, P 17 50 593.0
Int. Cl. B23p *3/00, 25/00*
U.S. Cl. 29—458 **4 Claims**

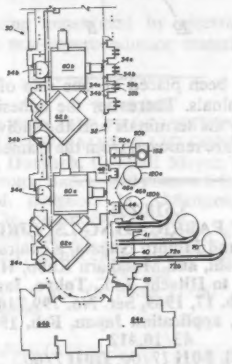


A hard-to-machine part, such as a cast liner for the housing of a grinding mill, is provided with an adhering layer of moldable polymeric material forming a smooth contact surface to bear upon a coacting surface of a supporting member, such as a mill housing.

3,618,199
AUTOMATED METHOD AND SYSTEM FOR FABRICATING SEMICONDUCTOR DEVICES

Lewis C. King, Dallas, Gerald A. Yearsley, Garland, Anthony L. Adams, Dallas, Marion I. Simmons, Richardson, and Eugene G. Altenburger and Billy P. Yager, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 30, 1969, Ser. No. 837,843
Int. Cl. B01j *7/00, 17/00*
U.S. Cl. 29—569 **17 Claims**



An automatic method and system for packaging discrete semiconductor devices such as transistors is described. The system includes a chassis for indexing a plurality of chucks past a series of work stations. The work stations include three wire loading stations for loading flat-headed lead wires in the chucks, a glass loading station for placing a glass ring around the necks of the lead wires, a series of heaters for heating the glass rings, a pair of molding stations for molding the heated glass rings around the necks of the lead wires to form a header, an alloy station for placing the semiconductor devices in a predetermined orientation on the head of one of the lead wires, and a series of automatic bonding stations for connecting the base and emitter contacts of the semiconductor devices to the heads of the other lead wires.

The overall system is controlled by a digital computer. Stations are provided for detecting the absence of a lead wire, the absence of a glass ring, or the absence of a transistor device. The system also detects failure of any one of the bonder stations and terminates operation of the system. The computer is programmed to provide shift registers which define each index position of the chassis and logic signals are shifted through the shift register to continually locate any chuck which is defectively loaded so as to prevent the successful completion of a header assembly. The computer then disables each subsequent station as the defectively loaded chuck is positioned at the respective station.

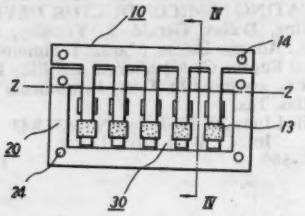
3,618,200
METHOD OF MANUFACTURING CHIP-SHAPED PASSIVE ELECTRONIC COMPONENTS

Masao Matsuo, Takarazuka, and Hiroshi Tomiwa, Osaka, Japan, assignors to Matsuo Electric Company, Limited, Osaka-fu, Japan

Filed Apr. 17, 1970, Ser. No. 29,413
Int. Cl. B01j *17/00*
U.S. Cl. 29—570 **5 Claims**

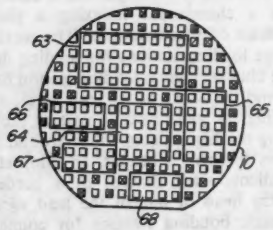
An improved method of manufacturing an electronic component wherein a plurality of elements are formed on

the ends of a plurality of elongated conductive members. The elements and conductive members are then electrically connected to terminals carried by a frame, and the resultant structure is then enclosed by a resin after an



adhesive sheet has been placed on one side of the frame to protect the terminals. Thereafter the adhesive sheet is removed to expose the terminals and the individual completed components are removed from the frame.

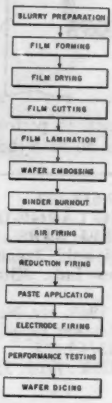
3,618,201
METHOD OF FABRICATING LSI CIRCUITS
Tsugio Makimoto and Minoru Nagata, Kodaira-shi, Akira Masaki, Hatano-shi, and Masaharu Kubo, Hachioji-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 17, 1969, Ser. No. 799,710
Claims priority, application Japan, Feb. 19, 1968, 43/10,412
Int. Cl. B01j *17/00*; H01l *7/00*
U.S. Cl. 29—574 **7 Claims**



A method of fabricating LSI circuits, which comprises testing unit cells formed in a semiconductor wafer to select qualified unit cells, sectionalizing the qualified unit cells into block regions each including a suitable number of qualified unit cells, and applying a previously prepared fixed metalization pattern mask onto each block region to achieve interconnection between the unit cells contained in said each block region, thereby establishing a plurality of LSI circuits of different types on the single semiconductor wafer.

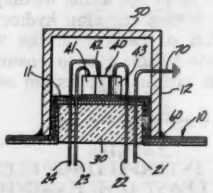
3,618,202
CERAMIC CHIP ELECTRICAL COMPONENTS
James P. Callahan, Woodland Hills, Calif., and Richard A. Stark, Des Plaines, Ill., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Continuation-in-part of application Ser. No. 625,459, Mar. 23, 1967. This application May 12, 1969, Ser. No. 823,667
Int. Cl. B01j *17/00*; H01j *5/00*
U.S. Cl. 29—580 **37 Claims**

The disclosure presents a miniature ceramic chip capacitor primarily for use in hybrid integrated circuits. The capacitor electrodes are external and coplanar, being separated by a recess in the ceramic body. A pattern of grooves defining a number of capacitors and their electrode surfaces is embossed or formed on one surface of a green ceramic film usually having a plastic binder. An electrode is applied to the coplanar electrode surfaces of the matured



ceramic body such as an electrode paste by a printing operation. PN-junction dielectric layers can be formed, if desired, beneath the electrode surfaces by alloying and thermal reoxidation.

3,618,203
METHOD OF MAKING A GLASS OR CERAMIC-TO-COMPOSITE METAL SEAL
Michael J. Pryor, Woodbridge, Conn., assignor to Olin Mathieson Chemical Corporation
Filed Aug. 25, 1969, Ser. No. 852,775
Int. Cl. C03c *27/02*; C21d *1/26*; H01l *1/10*
U.S. Cl. 29—588 **14 Claims**



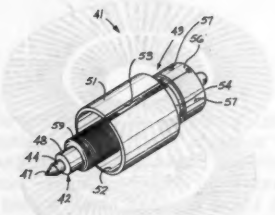
A composite metal product, glass or ceramic-to-metal seals using the composite, and the method of making these products. The composite has the properties of a low coefficient of expansion, approximating that of the glass or ceramic, good thermal conductivity, and fine grain size in the annealed condition. This is achieved by cladding an alloy having a low coefficient of expansion on either side of a low carbon steel core having a thermal conductivity of at least 20 B.t.u./sq. ft./ft./hr./° F. The thickness of the cladding on either side of the core not exceeding 33⅓% of the total thickness of the composite. The low carbon steel core contains up to 0.20% carbon and preferably up to 0.15% carbon and has a grain size of no more than 0.045 mm. after annealing of the composite. The composite is cold rolled at least 70% and preferably at least 80%, it is then annealed between about 1330° F. and 1600° F. and preferably between about 1500 F. and 1600° F., for no longer than 30 minutes and then rapidly cooled to room temperature. The heat-up rate must be faster than 100° F. per minute and preferably faster than

250° F. per minute. The seal is made by forming a cup shaped header having apertures, out of the composite. Electrical conductors are then inserted through the apertures and the cup is then filled with glass or ceramic to seal the conductors in place.

3,618,204
METHODS OF ASSEMBLING ELECTRICAL COMPONENTS

Thomas A. La Valle, Annapolis, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 19, 1969, Ser. No. 878,017
Int. Cl. G01r *4/00*; G05f *4/00*; H01h *4/00*
U.S. Cl. 29—593 **4 Claims**



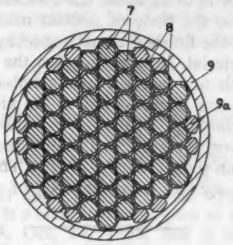
A rotatable turntable having a plurality of workholders spaced about the periphery thereof is indexed to advance each of the workholders successively through each of a plurality of work stations positioned adjacent the periphery of the turntable to assemble electrical components. A first part positioned in one of the workholders at a first work station has the leading end of an insulated wire extending from a supply of wire welded thereto at a second work station, after which the first part is indexed to a third work station without severing the wire extending from the first part to the supply. At the third work station a portion of the wire extending to the first part in the workholder is severed from the supply and the new leading end of the wire is attached to the first part in the next succeeding workholder. The first part is rotated in the first workholder while tensioning the wire extending from and secured to the first part to wind the wire thereon as the workholder is advanced with the turntable through a fourth and a fifth work station to a sixth work station. At the sixth work station a second part is assembled to the first part and, simultaneously, the insulation on a portion of the wire extending from the first part is stripped. At a seventh work station the trailing portion of the wire is welded to a metal cap which is secured to the second part and the strength of the weld is tested, whereafter the electrical component is advanced to a last work station and tested electrically and then sorted.

3,618,205
METHOD OF FABRICATING A COMPOSITE SUPERCONDUCTING WIRE

Anthony Clifford Barber, Lichfield, Laurence Reginald Hawtin, Birmingham, and Peter Harlow Morton, Solihull, England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Original application Apr. 18, 1968, Ser. No. 722,475. Divided and this application June 6, 1969, Ser. No. 857,245
Claims priority, application Great Britain, Apr. 27, 1967, 19,378/67
Int. Cl. H01v *11/00*; B23p *17/00*
U.S. Cl. 29—599 **7 Claims**

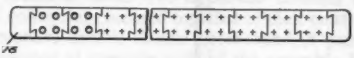
An electrical conductor having superconducting properties comprising a plurality of continuous superconductor elements each having a mean thickness of less than 25 microns, and electrical insulation material electrically insulating substantially all of the elements one from another, from 0 to 30 percent by weight of the conductor being constituted by electrically conductive noncoductive non-superconductor material.



3,618,206
PROCESS FOR THE PRODUCTION OF SUPERCONDUCTIVE METALLIC CONDUCTORS

Paul Gubler, Dornach, Gundolf Meyer, Fislisbach, Jean-Marie Rayroux, Baden, and Hansueli Schurch, Dornach, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Mar. 28, 1969, Ser. No. 811,478
Claims priority, application Switzerland, Apr. 5, 1968, 5,197/68
Int. Cl. H01v *11/00*
U.S. Cl. 29—599 **10 Claims**

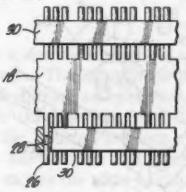


A process for producing a superconductive metallic conductor having a strip-shaped form in which a plurality of rods of superconductive material are introduced into bores in press blocks made of a stabilizer material. These blocks are then pressed out into continuous lengths having a substantially rectangular profile. A first group of these lengths is then drawn or rolled to provide a first group of profiled wires having ribs along opposite sides, a second group of these lengths is similarly worked to provide a second group of profiled wires having grooves along opposite sides, and the wires of the first and second groups are then joined together in alternation and in side-by-side relation such that the ribs and grooves interconnect. The joined together lengths are then worked again to establish the final profile of the conductor.

3,618,207
METHOD OF MANUFACTURING STRIP CONNECTORS

Robert H. Sand, La Mirada, and Cecil W. Libby, Sierra Madre, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of appplication Ser. No. 608,931, Jan. 12, 1967. This appplication Sept. 2, 1969, Ser. No. 860,148
Int. Cl. H02g *15/00*
U.S. Cl. 29—629 R **4 Claims**



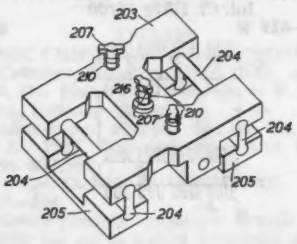
A method of assembling a plurality of contacts in a configuration such as a strip connector. The steps of the

method call for stamping or milling the multiple contact configuration from a blank of contact material, molding a connector housing about the contacts while they are still attached to the body of contact material and thereafter shearing the finished connector away from the body of contact material. In one variation the milled contacts are pins which are inserted into tubular connectors or sockets which are then secured to the pins by means of mechanical crimping. Thereafter the molding step is undertaken to form a connector housing about the plurality of crimped pin-socket combinations. The finished connector is then sheared from the body of contact material as before.

3,618,208
FRUIT KNIFE
Richard B. Cronheim, 7 Upper Barnes, St. Louis County, Mo. 63124
Filed June 24, 1969, Ser. No. 836,076
Int. Cl. A47j *17/04*
U.S. Cl. 30—24 **1 Claim**

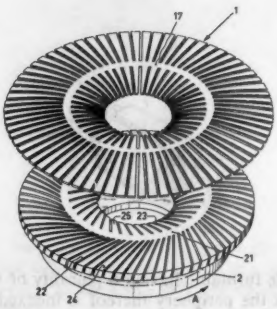
A fruit knife adapted especially for preparation of citrus fruits having a handle, a blade projecting coaxially from said handle and with each of its side edges being serrated throughout substantially the extent thereof; said blade being angulated at its end remote from the handle, at an angle within the range of 16 to 24 degrees to the plane of the major portion of the blade. The free end edge of said blade is arcuated, being endwise convex, and sharpened to define a cutting portion of greater extent than the width of said blade.

3,618,209
DRIVE SYSTEM FOR CONTROLLING MOTION OF THE SHAVING ELEMENTS OF AN ELECTRIC SHAVER
Giancarlo Battigalli, Milan, Italy, assignor to Mistrelettrica S.R.L., Milan, Italy
Filed Mar. 7, 1969, Ser. No. 805,172
Claims priority, application Italy, Mar. 8, 1968, A 13,694/68
Int. Cl. B26b *19/26*
U.S. Cl. 30—43.3 **5 Claims**



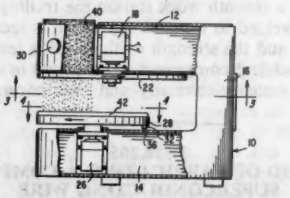
A drive system for controlling the motion of the shaving elements of an electric shaver, consisting of a mechanical oscillator unit operating as an articulated parallelogram.

3,618,210
DRY-SHAVING APPARATUS HAVING A DEFORMABLE CURVED SHEAR PLATE
Frans Zuurveen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of application Ser. No. 665,850, Sept. 6, 1967. This application July 18, 1969, Ser. No. 849,553
Claims priority, application Netherlands, Sept. 13, 1966, 6612851
Int. Cl. B26b *19/16*
U.S. Cl. 30—43.6 **10 Claims**



A dry shaver having a thin, resilient shear plate that is formed into a partial toroid and has a plurality of hair-receiving apertures, a cutter which moves about substantially the entire surface of the shear plate, and means for maintaining the cutting surface in pressure contact therewith.

3,618,211
CHEESE SHREDDER AND SPREADER DEVICE FOR PIZZA PIES AND THE LIKE
Henry H. Gibbs, 3010 Rice Ave., Pueblo, Colo. 81005
Filed Dec. 5, 1969, Ser. No. 882,442
Int. Cl. A01j *21/00*
U.S. Cl. 31—6 **5 Claims**

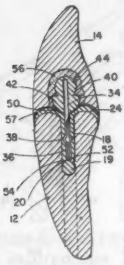


A cheese shredder and spreader device for use in making pizza pie and the like, comprising a substantially C-shaped frame with a circular or disk-like shredder disposed adjacent the upper portion of the C-frame with a wedge shaped opening for holding cheese therein to be shredded by said disc member, and a lower platform for holding the pizza dough, said lower platform being disposed below said shredder and adapted to receive the shredded cheese therefrom, with means for rotating said shredder and for rotating said lower platform for one turn only to spread a predetermined and uniform amount of cheese and the like on the dough disposed on the lower platform.

3,618,212
DENTAL PROSTHETIC CONSTRUCTION

Bernard Weissman, 304 Ashland Place, Brooklyn, N.Y. 11217

Filed Nov. 19, 1969, Ser. No. 878,101
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A 22 Claims



Apparatus and method for securing a dental prosthetic structure, such as a false tooth, crown or the like, to a patient's tooth stub or jawbone and comprising the drilling of a bore in the tooth stub or jawbone, placing a preformed hollow sleeve having a closed distal end, an open proximal end and an internally bowed intermediate portion, into said bore, forming a saddle conformal with the configuration of said tooth stub including said sleeve as an integral part thereof, positionally securing said saddle with respect to said tooth stub, placing the lower spring portion of an intermediate joinder member within the hollow sleeve, the spring portion having a bowed intermediate part which is urged into said bowed intermediate portion of said sleeve to thereby positionally secure said intermediate joinder member with said prepared tooth stub, the upper portion of said joinder member having an anchoring protuberance thereon, forming a prosthetic structure with an opening in the bottom thereof with the bottom peripheral configuration conformal with that of the prepared tooth stub, and securing said prosthetic structure to said prepared tooth stub by cementing said anchoring protuberance within said opening in said prosthetic structure.

3,618,213
DENTURE LINERS

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

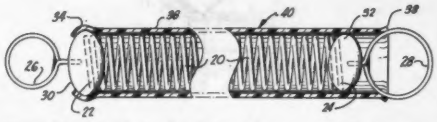
No Drawing. Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, and Ser. No. 650,259, June 30, 1967, and a division of application Ser. No. 654,044, July 5, 1967. This application Apr. 27, 1970, Ser. No. 32,447
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 3 Claims

A process for preparing hydrophilic cross-linked polymers and products prepared thereby, said process comprising admixing in a solvent-free system in the presence of a free radical, vinyl polymerization catalyst and reacting a major amount of a water-soluble polymerizable monoester of an olefinic acid having at least one substituted functional group with a minor amount of a polymerizable diester of one of said olefinic acids having at least two esterifiable hydroxyl groups. The novel products include a solid friable foam which can be disintegrated to powder. Shaped bodies can be prepared in the form of articles which can be cast with or without additives such as fragrances, medicinals, flavors, chemicals and the like, which are gradually released from the article when it is wetted in water or alcohol. Liquid casting syrups adapted to be polymerized in situ with or without additives can be formed and can be used for example in preparing denture liners. The casting syrups can be prepared in water to yield a polymer soluble in alcohol which is suitable for formation of hydrophilic coatings as by spray, dip, casting and the like.

3,618,214
COILED WIRE SPRING APPLIANCES FOR USE IN ORTHODONTICS

Maclay M. Armstrong, 1306 N. 175th, Suite 106, Seattle, Wash. 98133

Continuation of application Ser. No. 634,029, Apr. 17, 1967, which is a continuation-in-part of application Ser. No. 504,679, Oct. 24, 1965, and a continuation of application Ser. No. 835,882, June 9, 1969, all now abandoned. This application May 4, 1970, Ser. No. 33,151
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A 31 Claims

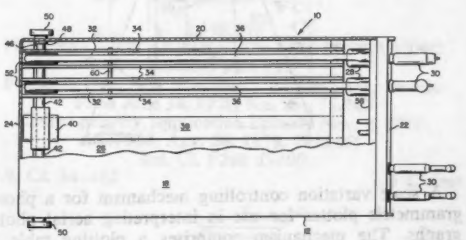


An orthodontic spring applicance to replace rubber or latex elastic bands for application of corrective intermaxillary forces to teeth. The appliance includes several coaxial coil springs secured together at their ends and having a protective flexible sheath therearound. A pair of eyelets are secured at opposite ends of the assembly for engagement with hooks on orthodontic arch wires, brackets, etc. One or more of the coaxial springs may be wound with initial tension, or may be wound as a compression spring to regulate the force delivered by the assembly upon elongation.

3,618,215
DENTAL EQUIPMENT STAND

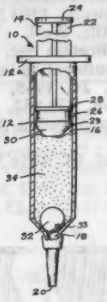
Bruce A. Hopkins, West Lebanon, N.H., and Walter P. La Force, Penfield, and John J. Valeska, Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed May 18, 1970, Ser. No. 38,030
Int. Cl. A61c *19/02*
U.S. Cl. 32—22 9 Claims



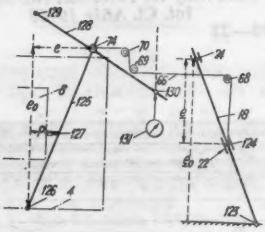
Disclosed is a dental equipment stand with a manual retraction system. The stand comprises a horizontally oriented housing having an open bottom and a slide member movable in the housing from the front to rear, the utility lines in the housing are looped about the slide for supporting the lines within the housing. Pulling on any one utility line moves the slide to the front of the housing allowing the line to sag through the open bottom. The slide is manually moved to the rear of the housing to draw the sagging portion of the lines back into the housing through the open bottom.

3,618,216
PROCESS AND APPARATUS FOR MIXING AND DISPENSING DENTAL PLASTER
Charles G. Jaeger, 1955 Bronson Drive, Minneapolis, Minn. 55432
Filed May 12, 1970, Ser. No. 36,514
Int. Cl. A61c 3/00
U.S. Cl. 32—40 11 Claims



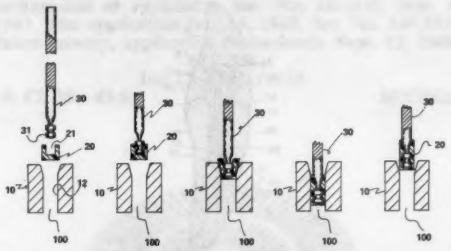
A dental plaster mixing and dispensing device consisting of a syringe formed from a tough impact plastic resistant material such as plastic having a plunger mounted for sliding movement therein, a combined mixing and valve element, e.g. a steel ball positioned in the syringe and adapted when the syringe is in an upright position to seal an outlet.

3,618,217
SCALE VARIATION CONTROLLING MECHANISMS
Edgar Hynes Thompson, 79 Park Road, London, W. 4, England
Filed Feb. 20, 1970, Ser. No. 13,017
Claims priority, application Great Britain, Feb. 28, 1969, 10,907/69
Int. Cl. B43l 13/00; G01c 11/00
U.S. Cl. 33—20 D 10 Claims



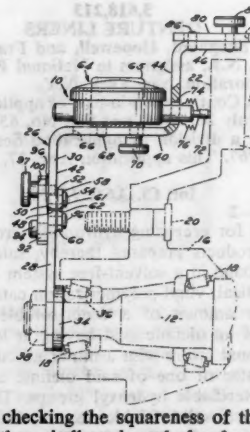
A scale variation controlling mechanism for a photogrammetric plotter for use in interpreting aerial photographs. The mechanism comprises a plotting table, a holder for a drawing member which is to draw a plan on the plotting table, first and second relatively movable tables mounted on a common carriage and which support two photographs showing a region of overlap, means connecting the relatively movable tables to the holder, a stereoscopic viewing system for viewing the region of overlap on the photographs, means for relatively adjusting the viewing system and each of the relatively movable tables independently so as to provide at least a part of a correction of any tilt of each photograph with respect to the horizontal and of any difference in the height of the two stations from which the photographs were taken.

3,618,218
PROCESS FOR MEASUREMENT OF INACCESSIBLE SMALL DIAMETER BORES
Rano J. Harris, Sr., 1945 Carolyn Sue Drive, Baton Rouge, La. 70815
Filed Oct. 21, 1969, Ser. No. 868,097
Int. Cl. G01b 3/00
U.S. Cl. 33—174 R 11 Claims



A method for the accurate, precise and rapid measurement of relatively inaccessible openings of small internal diameter, including especially capillary size openings. In taking a measurement, a segment of thermoplastic material of cross-section somewhat larger than the diameter of the opening or bore to be measured is fitted upon a male member, is forced into and compressed within the internal opening to be measured, the thermoplastic material thereby taking the external shape and size of the opening. The thermoplastic material, while in place, is heated, preferably above its softening point, set, and then withdrawn from the said opening. Measurement ex situ of the outside diameter of the withdrawn segment of thermoplastic material, because of the retention by the latter of the size and shape of the internal opening, permits highly accurate and precise measurement of the inaccessible internal opening.

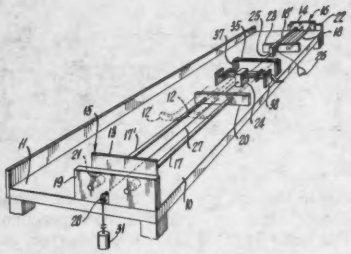
3,618,219
GAGE
James P. Kelly, Farmington, Mich., assignor to A. G. Davis Gage & Engineering Co., Hazel Park, Mich.
Filed Oct. 15, 1969, Ser. No. 866,580
Int. Cl. G01b 3/38
U.S. Cl. 33—181 AT 12 Claims



A gage for checking the squareness of the rotor of a disc brake to the spindle axis and also for checking the parallelism of the two faces of the rotor.

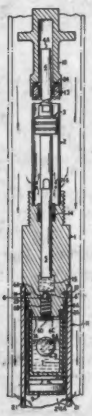
The frame which mounts the gage has a resilient portion which is made rigid while checking squareness of the rotor relative to the spindle axis, and is released while checking parallelism of the two faces of the rotor.

3,618,220
SKI-MOUNTING BENCH
Ferman G. Skelton, P.O. Box 172, Stowe, Vt. 05672
Filed Nov. 20, 1969, Ser. No. 878,307
Int. Cl. B23f *1/32*
U.S. Cl. 33—189 24 Claims



The invention contemplates ski-mounting bench or the like structure which incorporates mechanism whereby, for each ski or pair of skis placed on the device, a simple initial action responds to the probed overall length of the ski or skis to automatically determine the longitudinal center of the ski or skis. The apparatus includes means for thereafter clamping the skis with reference to the bench and to a center-identifying structure, so that all basic binding layout and mounting operations can proceed with the skis in centered array.

3,618,221
BOREHOLE SURVEY MEANS AND CORE SAMPLE ORIENTING MEANS
John Brian Robinson, Sutherland, New South Wales, Australia, assignor to Joint Coal Board, Sydney, New South Wales, Australia
Filed Jan. 14, 1969, Ser. No. 791,060
Claims priority, application Australia, Jan. 19, 1968, 32,455/68
Int. Cl. E21b *47/02*
U.S. Cl. 33—205.4 11 Claims

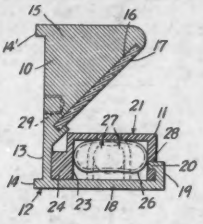


Means are provided for determining the horizontal direction (azimuth) and angle from the vertical (inclination) of a borehole at or near its bottom. To do this a tube of gellable liquid and a reservoir of a second liquid which can initiate gelling of the first liquid are assembled and lowered with the drill string. The liquids are separated by a valve and a magnetic float floats in the first liquid. The valve is opened, when required, by varying the pressure on the drilling liquid and the first and second liquids are allowed to mix. Gelling occurs and the magnetic float is "frozen" in the gel.

Examination of the float and meniscus later enable the inclination and azimuth of the hole to be determined.

By using appropriate datum marks on the various components, the core strata can be orientated.

3,618,222
DUAL SPIRIT LEVEL UNITS WITH SIMULTANEOUS VISION
Seymour A. Ostrager, Bronx, N.Y., assignor to Miracle Instrument Co., New York, N.Y.
Continuation of application Ser. No. 670,943, Sept. 27, 1967. This application Dec. 10, 1969, Ser. No. 880,493
Int. Cl. G01c *9/24*
U.S. Cl. 33—211 2 Claims

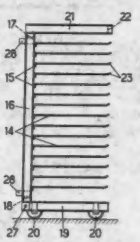


A spirit level unit in the form of an assemblage, comprising a body part supporting a spirit casing, having two spirits arranged at right angles to each other and the body part supporting a mirror for simultaneous reading of both spirits of said casing.

3,618,223
PROCESS FOR PATENTING HOT-ROLLED STEEL WIRE IN A FLUIDIZED BED
Hans Geipel and Eckehard Förster, Oberhausen, and Wilfried Heinemann, Dinslaken, Germany, assignors to Huttenwerk Oberhausen AG, Oberhausen, Germany
No Drawing. Filed July 17, 1970, Ser. No. 55,991
Claims priority, application Germany, July 25, 1969, P 19 37 918.1
Int. Cl. F26b *5/00*; F27d *9/00*
U.S. Cl. 34—9 5 Claims

A fluidized bed used in the patenting of steel wire and comprising a unidirectional flow of gas entraining a mass of zirconium-silicate particles of substantially spherical shape and 0.1 mm. mean diameter in an elongated conduit is driven with a power density of 700 to 4000 m·kp./sec. per square meter of conduit cross-section.

3,618,224
PROCESS AND APPARATUS FOR PRODUCING DRIED FRUITS
François Duc, "La Sabatiere," 24 Bergerag, France
Filed June 30, 1970, Ser. No. 51,262
Claims priority, application France, Nov. 4, 1969, 6937910; Apr. 30, 1970, 7015861
Int. Cl. F26b *19/00*
U.S. Cl. 34—12 6 Claims



The invention relates to improvements in the techniques for drying fresh fruits. A unitary multiple tray

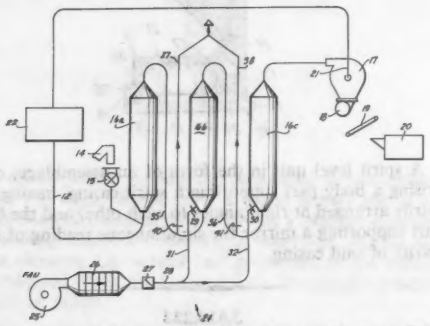
structure is provided as well as a corresponding unitary multiple baffle structure. The two are designed to intermesh whereby the baffles close off various boundaries of the respective trays and the assembled pair of structures is then tiltable to a position whereby the trays assume a vertical position to have fruit dropped thereinto with the baffles serving to guide the fruit and to maintain it in a single layer relative to each tray.

3,618,225

APPARATUS FOR AIR DRYING TOBACCO

Francis J. Ballard, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 15, 1970, Ser. No. 46,294
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 A **10 Claims**



A closed system is provided for drying tobacco by heated circulating air. The tobacco is initially introduced into the system in the path of the heated air. A plurality of heating chambers are in the system through which the air-conveyed tobacco is dried. When the tobacco has reached the desired degree of drying, it is removed from the system beyond the heating chambers. The system also provides for the recirculation and reconditioning of the air in order that it is at the desired temperature and moisture content at the point of introduction of the tobacco. The heated air supply at the location of the heating chambers is supplemented in order to increase the drying efficiency and the tobacco through-put of the system. The supplemental heated air supply includes a bleed for air between chambers which is thereafter replenished by the supplemental heated air system. In this manner, the temperature of the air is increased at this location in the system between chambers.

ERRATUM

For Class 34—68 see:
Patent No. 3,618,230

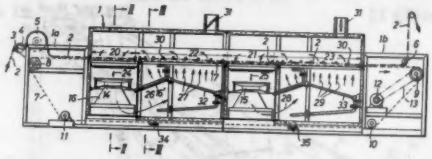
3,618,226

APPARATUS FOR CONTINUOUSLY DRYING WEB MATERIAL, ESPECIALLY TEXTILE MATERIAL

Rolf Goldenberg, Erich Hilgeroth, and Alfons Schrader, Remscheid-Lennep, Germany, assignors to Maschinenfabrik Friedrich Haas & Co., Remscheid-Lennep, Germany

Filed Oct. 24, 1969, Ser. No. 869,163
Int. Cl. F26b *13/12*
U.S. Cl. 34—156 **17 Claims**

Apparatus for continuously drying web material, especially textile material, in which the material is fed onto an elongated air-permeable conveyor moving in longitudinal direction and in which at least at one longitudinal portion of the conveyor air is passed in downward direction through the conveyor and the web superimposed thereon so that the web will adhere to the conveyor to be transported thereby in longitudinal direction, in which at least in another longitudinal portion of the conveyor



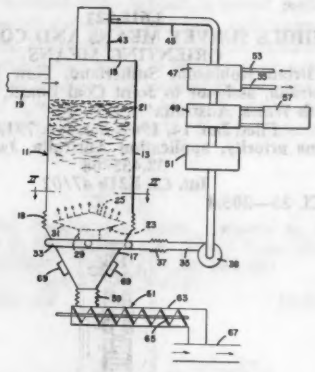
adjacent to the one portion air is passed in upward direction through the conveyor and the superimposed web so that the latter is lifted from the conveyor, and in which means are provided above the other portion of the conveyor for limiting movement of the web away from the conveyor.

3,618,227

PARTICLE DRYING APPARATUS

James Harry Breakell, Swarthmore, and Edwin L. Nicholson, Springfield, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 26, 1970, Ser. No. 22,950
Int. Cl. F26b *3/16*
U.S. Cl. 34—164 **6 Claims**



Apparatus for continuous drying of particles as they move through a tank by gravity and counter-current to a flow of heated, dry gas delivered under pressure through a distributor positioned within the tank, in spaced relationship with the walls thereof. The distributor has a conical, perforated top wall which facilitates the free flow of particles relative thereto and distributes the heated, dray gas as a plurality of diverging streams. Means are provided for vibrating the lowermost end of the tank, including the gas distributor, to minimize bridging of particles between the tank and the gas distributor.

3,618,228

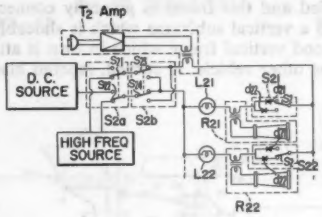
QUESTIONEE'S RESPONSE DETECTION AND COMMUNICATION

Masami Koizumi, Kawasaki-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 19, 1969, Ser. No. 851,329
Claims priority, application Japan, Aug. 24, 1968, 43/60,802
Int. Cl. G09b *7/02*
U.S. Cl. 35—9 R **3 Claims**

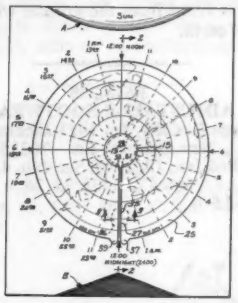
A questionee's response detection and communication system wherein a device for displaying and/or recording

the response of each of the questionees is electrically connected to a questionee's response selection switch consisting of a pair of rectifier elements connected in back-to-back relation and a selection switch for selecting either of said rectifier elements and to a polarity change-over



switch which is adapted to be selectively connected to a DC source and to change over the polarity thereof. AC may be selectively passed through a circuit in which a transmitter on the side of said polarity change-over switch is electrically coupled to a receiver provided for each of said questionee's response selection switches.

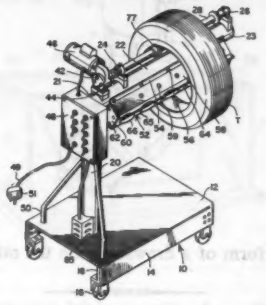
3,618,229
DEVICE FOR TEACHING GEOGRAPHY, TIMES AND DATES
Melvin J. Frost, 253 N. Fraser Drive, Mesa, Ariz. 85201
Filed June 30, 1969, Ser. No. 837,554
Int. Cl. G09b *29/00*
U.S. Cl. 35—44 **8 Claims**



A base member of plane or spherical surface and bearing time indicia has axed thereto but spaced therefrom a sheet or hollow spherical element of translucent flexible material slitted so that a rotatable cartographic member of similar form can be moved continuously in one rotational direction outside of or interleaved between the transparent member and the base member. A hub element for the flexible transparent member which is anchored to the base member provides circumferential tracks for the rotatable cartographic member both outside and inside the transparent member so that the cartographic member can be rotated selectively in the inner or outer position with respect to the transparent member, the transparent member being flexible and slotted but not rotatable.

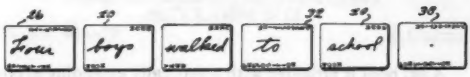
3,618,230
TIRE DRYING AND CONDITIONING MACHINE
Phillip M. Wilson, Hartford, Ill. (133 Whitelaw Ave., Wood River, Ill. 62095)
Filed Aug. 21, 1970, Ser. No. 65,883
Int. Cl. F26b *25/00*
U.S. Cl. 34—68 **10 Claims**

A tire drying machine has a horizontal platform on which is a vertical post carrying an axially horizontal stationary cylindrical body. A motor driven shaft is carried by the body in an elevated position and revolves tires axially mounted on the body. A housing carried by the body supports heating lamps exposed to interiors of tires



revolving with the shaft. A motor driven fan may circulate cooling air through the housing. Guide members on the shaft keep the tires from wandering axially while revolving.

3,618,231
EDUCATIONAL GAME
Helen G. Nason, 615 E. Broad St., Statesville, N.C. 28677
Filed June 3, 1970, Ser. No. 43,139
Int. Cl. G09b *19/00*
U.S. Cl. 35—35 J **13 Claims**

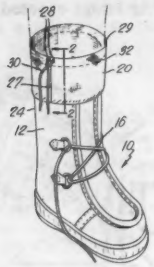


An educational sentence building game for teaching grammar with a deck of cards, each card having a plastic coated writing surface on which is displayed the name of a part of speech or the word "punctuation," and is otherwise substantially blank. A marking instrument, such as a grease pencil, and preferably a different colored marking instrument for each player, is provided for erasably marking on the writing surface of each card as it is selectively played a word that is the same part of speech as displayed thereon or a punctuation mark in the case of the cards on which the word "punctuation" is displayed. The game is played by players in turn selecting a card and writing a word or punctuation mark thereon in accordance with the part of speech or word "punctuation" displayed thereon, and playing the card in relation to previously played cards to build or complete a grammatically correct sentence.

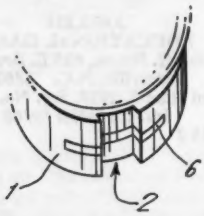
3,618,232
SLEEVED BOOT
Michael Shnuriwsky, 547 45th Ave., Ville La Salle, Quebec, Canada
Filed Apr. 24, 1970, Ser. No. 31,647
Claims priority, application Canada, Feb. 19, 1969, 75,372
Int. Cl. A43b *3/00*
U.S. Cl. 36—1.5 **11 Claims**

A boot having a relatively stiff upper terminating in a foot receiving mouth opening and a flexible tubular sleeve having one end secured about said mouth opening and

movable from a retracted position embracing the boot to an extended position above the boot and a closure preferably in the form of a drawstring on the other end of the sleeve.



3,618,233
ARRANGEMENT CONCERNING SKI BOOTS
Nils Eie, Tennisveien 6, Slemdal, Oslo 3, Norway
Filed Nov. 12, 1969, Ser. No. 875,712
Int. Cl. A43b
U.S. Cl. 36—2.5 **3 Claims**



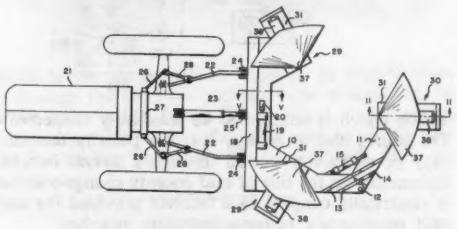
A ski boot is provided with a vertically extending groove at the rear edge of the heel, which is intended for cooperation with a fixed upstanding element on a ski, the upper free end of which fixed element is tapered so that the heel can be downwardly engaged on the element and automatically placed in correct position thereon.

ERRATUM

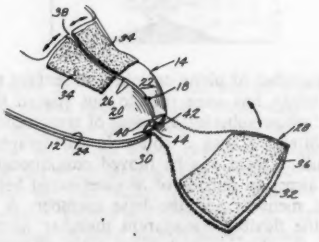
For Class 36—2.5 B see:
Patent No. 3,618,235

3,618,234
EXCAVATING AND TRANSPLANTING APPARATUS FOR TREES AND THE LIKE
Gary G. Bates, Austintown, Ohio
(9735 Harrison Road, Romulus, Mich. 48174)
Filed Mar. 4, 1969, Ser. No. 804,131
Int. Cl. A01g *23/06*
U.S. Cl. 37—2 R **5 Claims**

A machine for digging and lifting trees and shrubs with a mass of earth about their root systems. In a first embodiment a generally L-shaped frame is slideably attached along one leg to a vertical frame which is in turn secured to a tractor, lift truck, or other vehicle. A pair of curved tapered blades are slideably mounted on housings secured to opposite ends of the leg of said frame which is attached to the vertical frame. A third blade is carried on a housing mounted on the free end of a horizontal subframe which is pivotally connected to the free end of the second leg of the L-shaped frame. Double-acting hydraulic cylinders are mounted within each of the housings and connected to the baldes to force the blades into and out of the ground. Grooved vertical rails are provided on the housings and guide wheels running in the grooves of the rails are provided on the blade supports. The housings may also be provided with stake driving attachments. In the second illustrated embodiment a C-shaped frame is provided and this frame is pivotally connected at one corner to a vertical subframe which is slideably mounted on a second vertical frame which in turn is attached to a tractor or other vehicle. A curved, tapered blade is slideably carried by a housing at each of the free ends of the C-shaped frame. A third blade is carried by a housing mounted at the center of the intermediate leg of the C-shaped frame. Pins moving in slots in the housings and the face of the blades guide the blades along their desired path of travel. In each embodiment the blades when forced into the ground form a cone-like confinement for the root system of the tree and, when the apparatus is lifted, the tree or shrub is lifted from the ground with its roots and with a mass of earth.

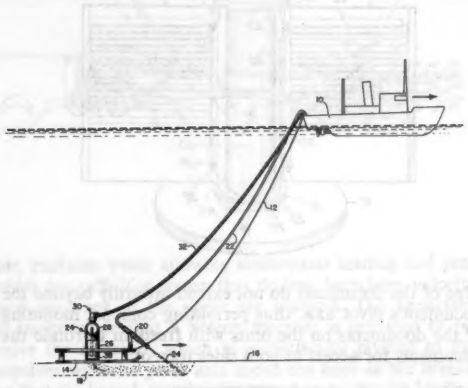


3,618,235
ADJUSTABLE FOOTWEAR
George R. Cary, Jr., 1411 Elconore St., New Orleans, La. 70115
Filed Jan. 19, 1970, Ser. No. 4,077
Int. Cl. A43b *23/26*
U.S. Cl. 36—2.5 B **11 Claims**



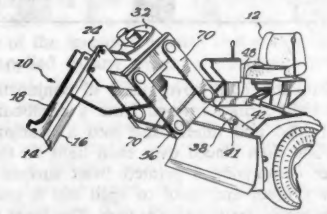
An orthopedic shoe, or other footwear, is provided with a toe covering which includes sections that are laterally adjustable and easily fixed in any given position of adjustment. The toe covering is split along a mid-line of the shoe to form two lateral sections that can be adjusted towards and away from the shoe mid-line; and a tongue-like element is secured to a forward part of the shoe to overlap the two lateral covering sections and to maintain the sections in desired adjusted positions. Infinite adjustment is available by the use of Velcro fastening surfaces (see U.S. Pat. 2,717,437) placed on the top of the covering sections and on the underside of the tongue-like element which overlaps the sections to maintain an adjustment.

3,618,236
APPARATUS FOR DIGGING AN UNDERWATER TRENCH
James D. Pipkin, 1700 Destrehan Ave., Harvey, La. 70058
Filed May 19, 1969, Ser. No. 827,481
Int. Cl. E02f 3/88
U.S. Cl. 37—63 5 Claims



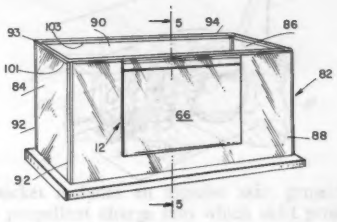
The combination of a towing ship and a towed underwater trench digging apparatus, and a suction and discharge mechanism mounted on said towed digging apparatus for sucking up and discharging the debris of digging to one side of a trench as it is dug, and the method of removal of digging debris in underwater trench digging with approximately little or no discharge conduit for any depth of water.

3,618,237
UNDERGROUND CABLE LAYING IMPLEMENT
Charles J. Davis, Wichita, Kans., assignor to J. I. Case Company
Filed Nov. 3, 1969, Ser. No. 873,152
Int. Cl. E02f 5/02; F16l 1/00
U.S. Cl. 37—98 4 Claims



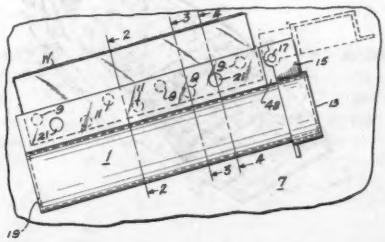
A vehicle supported implement which has an elongated, thin, flat blade fixed to an oscillating mechanism carried by a support. The blade is rapidly reciprocated to form a deep, narrow, continuous slit and supports a cable guide to simultaneously lay a continuous length of cable along the bottom of the slit. The support is isolated from a frame on the vehicle by torque cushioning elements each including an elastic member bonded to an inner member which is connected to each end of links extending between the frame and the support. Each elastic member is fixedly secured to either the frame or the support so that the elastic members absorb the reciprocal movement of the support and substantially isolate the frame from the support.

3,618,238
AQUARIUM TANK DISPLAY HOLDER
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Hawthorne, Calif.
Filed Aug. 19, 1969, Ser. No. 851,380
Int. Cl. G09f 3/18
U.S. Cl. 40—10 R 7 Claims



An aquarium tank having a pair of parallel opposing transparent end walls and a pair of parallel opssing transparent side walls, and a bottom wall, in combination with a wrapper adapted to be removably mountable to the inside surface of one of the walls and being visible therethrough, said wrapper formed of a blank foldable to define an open envelope having opposing front and rear sides joined by interconnecting end flaps contiguous with and defined from said front side, a stripe of adhesive provided on the face of said front side to removably mount the wrapper to an aquarium wall.

3,618,239
RAILWAY CAR DEFECT CARD HOLDER
James J. Hennessy, Jr., Chambersburg, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.
Filed Nov. 24, 1969, Ser. No. 879,083
Int. Cl. G09f 3/18
U.S. Cl. 40—19 4 Claims

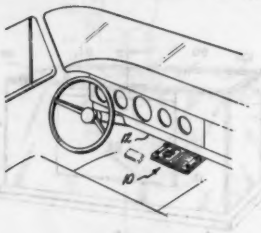


A defect card holder for application to a railway car comprising a hollow body of plastic material and having a substantially flat wall, there being a mounting plate embedded in and secured to the body flat wall and projecting far enough beyond it to lie flat against the surface of a car wall for welding the plate to the car wall without injuriously heating the plastic body.

3,618,240
ROUTE MAP AND FEATURE DISPLAY DEVICE FOR MOVING VEHICLES
Charles Pelin, Box 75, Eastsound, Wash. 98245
Filed Sept. 5, 1967, Ser. No. 665,349
Int. Cl. G09f 11/24
U.S. Cl. 40—42 5 Claims

A route map and feature display device for use in a moving vehicle, including an information strip carrying information the distance scale of which changes along its length, feed and take-up means for holding the strip,

means for displaying information exposed on the strip between the feed and take-up means, and drive means for advancing the strip progressively as a function of distance traveled. The drive means which varies the strip



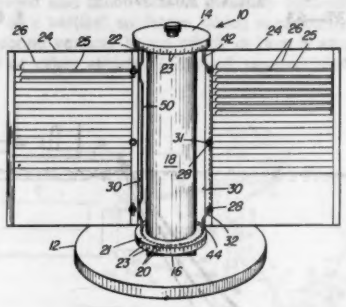
drive speed as a function of vehicle speed includes means responsive to the strip scale changes to change the drive ratio accordingly. An elongated flexible drive cable permits moving the display unit into different viewing positions when in use.

3,618,241
MULTIPLE RING LOOSELEAF BINDER
Wald Doty, Haddonfield, N.J., and George F. Drewel, Springfield, Pa., assignors to Buchan Loose Leaf Records Company, Clifton Heights, Pa.
Filed Feb. 20, 1969, Ser. No. 801,013
Int. Cl. B42f *13/20*
U.S. Cl. 40—104.14 6 Claims

A console-mounted looseleaf ring binder assembly having a plurality of horizontally arranged binders disposed in evenly spaced parallel rows in a case with each binder located at individual ones of a like plurality of separate stepped-back positions or levels in such manner that their looseleaf sheets extend therefrom in substantially flat horizontal disposition.

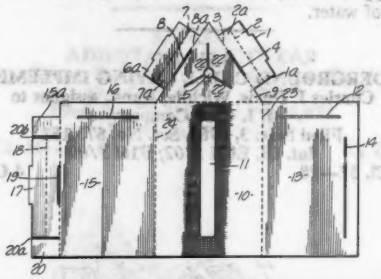
3,618,242
DOCUMENTARY DISPLAY UNIT AND MOUNTS USED THEREWITH
Henry V. Ivory, Chatham, N.J., assignor to Boorum & Pease Company, Brooklyn, N.Y.
Filed Jan. 23, 1970, Ser. No. 5,220
Int. Cl. G09f *11/06*
U.S. Cl. 40—104.18 7 Claims

There is disclosed a document display and storage unit and a hinge rod for pivotally mounting a document thereon. The unit includes a pair of spaced support members having corresponding holes to receive the hinge rods bearing the documents. The hinge rods have means for passing through and securing the documents such that the documents are coplanar with the hinge rods and the inner



edge of the documents do not extend inwardly beyond the document's pivot axis, thus permitting compact mounting of the documents on the units with freedom to rotate the documents for access to both sides thereof.

3,618,243
ORNAMENTAL LIGHT COVERING
Robert L. Bauder, 11664A Chandler, North Hollywood, Calif. 91601
Filed Apr. 22, 1968, Ser. No. 723,151
Int. Cl. G09f *13/04*
U.S. Cl. 40—131 R 1 Claim

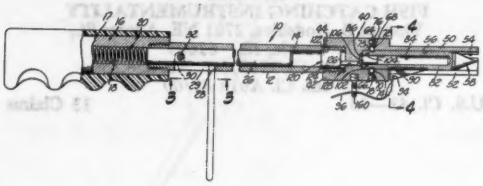


An ornamental light cover used in conjunction with Christmas light strings formed from a cardboard blank which is folded and interlocked into a triangular configuration and then placed over each light on the string. Each cover comprising a printed front surface bearing a letter or symbol and used to spell out a greeting or other messages as desired by the user. The front is darkly printed and the symbol remains blank so that the light will shine through.

3,618,244
METHOD FOR FIRING PROJECTILES UNDERWATER
Allan S. Johnson, 845 W. 16th St., Costa Mesa, Calif. 92627
Continuation-in-part of application Ser. No. 700,816, Jan. 26, 1968. This application Feb. 10, 1969, Ser. No. 798,061
Int. Cl. F41c *27/00*; F41f *1/00*
U.S. Cl. 42—1 L 7 Claims

A unique and improved method and apparatus for firing or launching projectile underwater. The method utilizes a weapon or gun in which standard blank cartridges

are used for firing or discharging the projectile. The method includes the step of fitting a water tight sleeve onto the blank cartridge, enclosing a body of air; loading the projectile such as a spear into the weapon from the muzzle end; and loading the cartridge with the water tight sleeve into a bore behind the projectile. The invention is particularly adapted for spear guns for underwater use using blank cartridges. The sleeve referred to enclosing



air, excludes water allowing underwater loading and provides for sufficient power that desired launching velocity and accuracy of the spear are realized. The apparatus is improved in that a breech member is provided to receive the cartridge which is eccentrically pivoted to the receiver with the pivot axis about the bore in the breech so that the breech member is rotated upwardly for loading thereby facilitating practice of the method underwater.

3,618,245

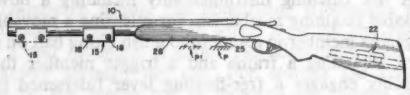
DEVICE FOR BALANCING GUNS

Gene M. Pruonto, 124 E. 1st Ave., Altoona, Pa. 16602

Filed Mar. 3, 1969, Ser. No. 803,566

Int. Cl. F41c *21/00, 23/00*

U.S. Cl. 42—1 R **7 Claims**



The invention relates to the problem of balancing guns, particularly shotguns so that a person owning several guns can give them all the same weight and balance them to give the same feel for all guns. The structure of the invention is such that a balancing weight can be applied to any gauge of shotgun whether it be single barrel, double barrel, or the so-called over-under type. The weight devices of the invention cen be adjustably secured anywhere along the length of the gun barrel, or barrels and/or in the bore of the gun stock in order to provide a balance point for any gun which will be the same balance point for all other shotguns in a shooter's collection. The invention is particularly important for trap and skeet shooting where it has been found that switching from one gun to another, where the guns have different balance points, affects the aim and skill of the shooter in a deleterious manner.

3,618,246

FIRING CHAMBER FOR CASELESS CARTRIDGE

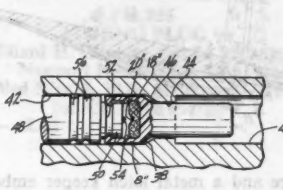
William B. Woodring, Stony Creek, Conn., assignor to Olin Corporation

Original application May 7, 1968, Ser. No. 727,164. Divided and this application Feb. 4, 1970, Ser. No. 8,637

Int. Cl. F41c *11/00, 15/00;* **F42b** *7/06*

U.S. Cl. 42—16 **1 Claim**

A cased cartridge for firearms in which the cartridge casing is expelled through the muzzle along with the projectile or projectiles to provide the advantages of caseless ammunition in a cased round. A system for chambering such a cased cartridge is disclosed, which system includes a bolt assembly having a nose portion of reduced diameter. The cartridge case is formed from resilient plastic material and includes a rearwardly open pocket containing a propellant charge and a primer. The pro-



pellant pocket includes an annular skirt projecting beyond the propellant charge into which skirt projects the bolt assembly nose. The bolt assembly nose interlockingly engages the skirt to permit extraction of an unfired round, but does not hinder expulsion of the casing through the muzzle if the round is fired. Cooperating shoulders are formed on the firing chamber and casing to position the cartridge for firing.

3,618,247

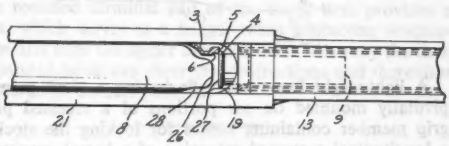
"SHORT THUMBING" TWO-STEP ABUTMENT FOR FEED LATCHES

Adolph L. Nelson, Detroit, Mich., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sept. 4, 1969, Ser. No. 855,317

Int. Cl. F41c *25/00, 25/08*

U.S. Cl. 42—17 R **3 Claims**



A novel feed latch for use in firearms. Two abutments are provided on the latch bar instead of the usual single abutment. The object is the elimination of a jamming condition caused by "short thumbing" a shotshell into the magazine tube. "Short thumbing" generally describes the careless or inadvertent error of improperly loading a magazine tube so the shell fails to engage with the feed latch abutment. This allows the shotshell to "float free" in the receiver, and very often jam between the shell carrier and the breech block carrier. The present invention contemplates placing a second step on the feed latch which will engage a "short thumbed" shotshell that had never engaged the first abutment. The two-step latch can be adapted to a variety of feed systems due to its overall universality and particularly because it will not interfere with or directly influence the feeding operation of the firearm.

3,618,248

BUTTSTOCK ASSEMBLY WITH A LATCHABLE DOOR FOR A COMPARTMENT FORMED THEREIN

Henry A. Into, Rocky Hill, Conn., and John K. Jorczak, Springfield, Mass., assignors to Colt's Inc., Hartford, Conn.

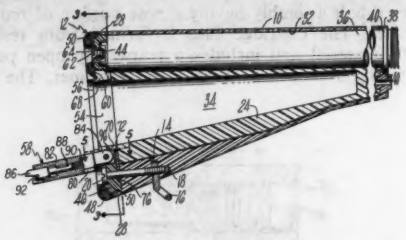
Filed June 13, 1969, Ser. No. 833,000

Int. Cl. F41c *23/00*

U.S. Cl. 42—71 R **8 Claims**

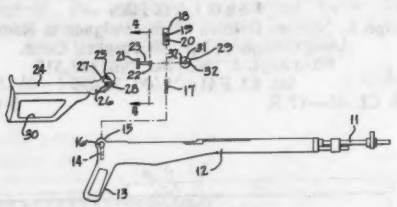
A buttstock assembly is provided with a stowage compartment in the buttstock and a removable butt plate hav-

ing a latchable door providing access to the compartment. The butt plate is a composite member having a resilient



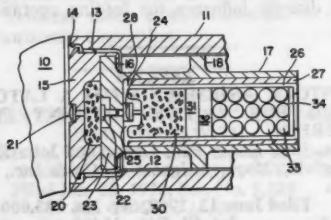
butt surface and a metal latch keeper embedded within its interior for cooperating with a slidable cartridge-operated latch detent on the door.

3,618,249
PIVOTALLY MOUNTED STOCK FOR FIREARMS
Andrew J. Grandy, North Hills, Pa., assignor to the United States of America as represented by the Secretary of the Army
Filed Aug. 1, 1969, Ser. No. 846,769
Int. Cl. F41c *23/00*
U.S. Cl. 42—73 **2 Claims**



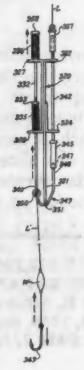
A lightweight low recoil rifle having a stock member pivotally mounted on ear portions of a recessed pistol grip member containing means for locking the stock as a longitudinal rearward extension of a barrel supporting forepart and another folded position 180° therefrom with the stock extending forwardly along the barrel in which a recessed handle portion of the stock is in a readily accessible location substantially overlying the firearm center of gravity.

3,618,250
LAUNCHING ARRANGEMENT FOR SUB-CALIBER PROJECTILES
Andrew J. Grandy, North Hills, Pa., assignor to the United States of America as represented by the Secretary of the Army
Filed Aug. 15, 1969, Ser. No. 850,462
Int. Cl. F41c *21/10*; F42b *5/14*
U.S. Cl. 42—77 **2 Claims**



Arrangement for launching sub-caliber cartridges from existing weapons while maintaining the weapon capable of its normal use. A sub-caliber cartridge is positioned within a traveling barrel from which it is separated subsequent to joint initial travel through a portion of a launching tube. Separate propellant charges are provided to obtain an initial launching pressure and a subsequent separation pressure within the launch tube.

3,618,251
FISH CATCHING INSTRUMENTALITY
Vincent B. Hodshire, 2701 NE. Adams St., Peoria, Ill. 61603
Filed Nov. 13, 1969, Ser. No. 876,330
Int. Cl. A01k *83/00*
U.S. Cl. 43—15 **13 Claims**

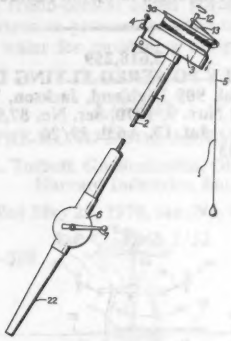


A fish catching instrumentality including a novel releasable retaining mechanism for releasing a movable fish engaging member in response to a fish biting bait on a fishhook including a frame and a trigger member that releasably engages a free-floating lever fulcrumed on the frame surface and loosely pivotally connected at an end to the fish engaging member. In one form of the invention, the fish engaging member is a spear and the fishhook is secured on the trigger member, so that when a fish bites, the free-floating lever is disengaged from the trigger member and resilient means drives the spear into the fish. In another form, the fishhook is associated with the fish engaging member and when the fish bites, the free-floating lever is disengaged from the trigger member, and resilient means biases the fish engaging member upwardly to sink the fishhook into the fish. A third form includes a free-floating lever loosely pivotally engaged at one end to the fish engaging member, with the other end engageable with a detent on the frame and releasable therefrom upon movement of the trigger member.

3,618,252
FISHING RODS
Benjamin Bocking, South Lowestoft, and Roy Gerald Catchpole, Lowestoft, England, assignors to Ness Point-Investments Limited, Lowestoft, England
Filed Aug. 21, 1969, Ser. No. 851,913
Claims priority, application Great Britain, Aug. 21, 1968, 40,058/68
Int. Cl. A01k *89/00*
U.S. Cl. 43—20 **7 Claims**

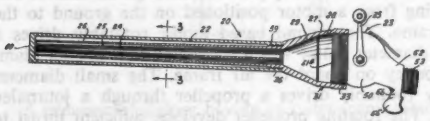
The invention relates to a fishing rod and reel which comprises a rod and spool, the spool being disposed on the end of the rod remote from the handle of the rod, the spool being coaxial with the longitudinal axis of the rod

and mounted for rotation relative to the rod by winding gear located at the handle of the rod, there being a



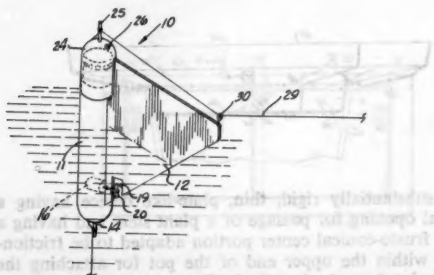
line guide on the rod adjacent a line-carrying cavity of the spool.

3,618,253
FISHING APPARATUS
Marshall R. Edwards, P.O. Box 42, Gonzales, La. 70737, and David M. Edwards, P.O. Box 825, Willis, Tex. 77378
Filed Mar. 2, 1970, Ser. No. 15,598
Int. Cl. A01k *87/04, 87/06, 97/08*
U.S. Cl. 43—26 **24 Claims**



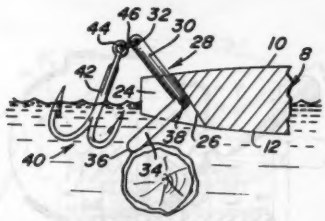
A collapsible fishing rod comprising telescoping tapered tubular sections through which a fishing line passes from a reel mounted in substantial alignment with the passageway through the rod. For storage the hollow handle of the fishing rod is removed and placed over the collapsed telescoped rod sections and made fast. In one embodiment, the rod is provided with reel seat means variably offset from the axis of the rod in order that various types of reels may be secured thereon in substantial alignment with the opening through the tubular rod.

3,618,254
FISHING DEVICE
Bruce Myers, 2400 Magnolia, South Daytona, Fla. 32021
Filed May 1, 1970, Ser. No. 33,658
Int. Cl. A01k *97/00*
U.S. Cl. 43—26.1 **5 Claims**



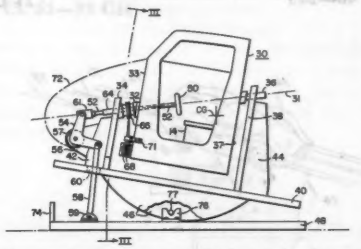
A fishing device in which a float is provided with a motor-driven propeller with power being supplied to the propeller by solar cells. A sail is secured to the fishing device to provide steerability and for offsetting the wind effect on the device. The fishing device supports a fish line with hooks, lures and the like and maintains the line at the desired fishing location.

3,618,255
FISHING PLUG
Millard H. Granger, Sr., 74 Post St., Newport News, Va. 23601
Filed Mar. 3, 1970, Ser. No. 15,976
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.42 **9 Claims**



A buoyant plug having a line attaching eye at its forward or leading end and having its rearward or trailing end bifurcated. The bifurcated end provides a pair of furcations and an intervening vertical kerf or notch which opens through the dorsal and ventral surfaces, respectively, and has an oblique angled stop shoulder. The furcations serve to mount a bellcrank whose upper arm has its rear end pivotally linked to the shank of a treble hook. The rounded terminal end of the lower arm provides a cam, which serves as a trigger when contacting obstructions and trips the upper arm and hook, whereby the then suspended hook can clear the obstructions and thereafter return to its normal position.

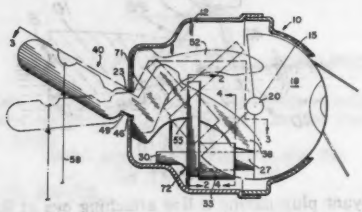
3,618,256
TOY AIRCRAFT DEVICE
Frank E. Monks, 1503 Broadview Drive, Bettendorf, Iowa 52722
Filed July 10, 1970, Ser. No. 53,744
Int. Cl. A63h *3/52*
U.S. Cl. 46—15 **5 Claims**



A toy device for simulating the attitudes of a vehicle in flight. The device comprises a cockpit structure for accommodating at least one child, the device employing a base structure having a curved bottom surface which permits the child to position the cockpit in any attitude of elevation (i.e., level flight, ascent or descent) within the limits of the curved bottom surface. A second embodiment of the invention further includes means for suspending the cockpit in a manner to permit rotation

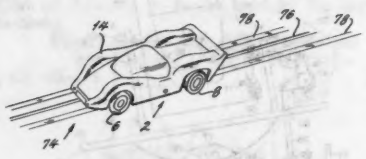
thereof about a longitudinal axis of the cockpit that is inclined from the front to the rear of the cockpit. The curved base structure and the rotation about the inclined axis permits the cockpit to assume the three basic attitudes of a vehicle in flight, namely, elevating, turning and banking.

3,618,257
MANUALLY AND AUTOMATICALLY OPERABLE SLEEPING DOLL EYE UNIT, PARTICULARLY FOR PUPPETS
William Leibowitz, Flushing, and Frank De Lise, Staten Island, N.Y., assignors to Dollac Company, Division of Jacoby-Bender, Inc., Woodside, N.Y.
Filed Dec. 21, 1967, Ser. No. 692,504
Int. Cl. A63h *3/40*
U.S. Cl. 46—169 A **10 Claims**



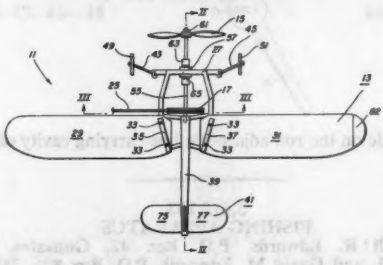
This invention relates to eyes for toys and particularly to an eye for use with puppets, which can open and close automatically in the usual manner or be actuated manually. Such an eye is particularly advantageous for use with puppets. A particular constructional feature is the provision of a lever carried by the rear shell of a conventional eye unit of the sleeping type which coacts with a bracket carried by the eyeball. The lever is manually actuatable as by a string or rod for rotating the eyeball to closed position and has a lost motion connection with the bracket so that the eyeball may be weight actuated in the usual manner for automatic opening and closing.

3,618,258
SLOT CAR HAVING IMPROVED FRAME AND ELECTRICAL PICK-UP
Charles William Clark, 1238 Watts, University City, Mo. 63130
Filed Jan. 15, 1970, Ser. No. 2,984
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 **21 Claims**



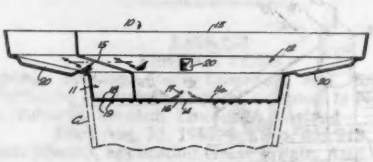
A slot car having a frame comprised of two side rails traversed at their ends by tubular journals which receive front and rear wheel axles. The rear axle carries a spur gear which meshes with a pinion gear or the drive shaft of a motor. The motor is nestled between the side rails such that its drive shaft is oblique to the rear axle. A guide arm hinges to the frame about a transverse hinge pin, and at its forward end is provided with a pin which engages the slot in the track on which the car runs. The guide arm further carries a dielectric cross bar at its forward end and the cross bar has a pair of contactors which engage electrified rails in the track. The contactors may be blades, U-shaped shoes, or metallic bristles. The body of the car is mounted to permit flexure of the frame.

3,618,259
REMOTELY POWERED FLYING DEVICE
Voorhis F. Wigal, 909 Highland, Jackson, Tenn. 38301
Filed Nov. 9, 1970, Ser. No. 87,974
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 **15 Claims**



A toy airplane that develops lift as it propels itself in a forward direction so as to become airborne. The airplane or air frame is remotely powered through an endless belt reaching from a motor positioned on the ground to the air frame. The ground based motor rotatably drives a large diameter pulley which is coupled to a smaller diameter pulley on board the air frame. The small diameter pulley rotatably drives a propeller through a journaled shaft. The rotating propeller develops sufficient thrust to move the air frame in a forward direction. The endless belt, being extremely small in cross section, e.g., cotton sewing machine thread or monofilament fishing line or the like, is kept taut by centrifugal force acting thereon as the air frame tends to fly a straight course but is restrained by the endless belt to follow a circular path. The device includes structure for remotely varying the speed of the propeller so that the air frame may be remotely maneuvered and controlled in flight. The maneuvers including, but not limited to, landings and takeoffs.

3,618,260
WEED-INHIBITING AND WATERING ATTACHMENT DEVICE FOR POTTED PLANTS
Robert T. Convey, Jr., 1030 Andora Ave., Coral Gables, Fla. 33146
Filed Apr. 2, 1970, Ser. No. 25,049
Int. Cl. A01g *9/02*
U.S. Cl. 47—32 **10 Claims**



A substantially rigid, thin, plate-like device having a central opening for passage of a plant stem and having a short frusto-conical center portion adapted to be friction-fitted within the upper end of the pot for attaching the device in place, is described. The bottom of the frusto-conical portion, in addition to the central plant stem open-

ing, is provided with a plurality of sidewardly-extending openings permitting the flow of water therethrough while at the same time minimizing the possibility of weed growth. The frusto-conical center portion merges into a peripheral extension portion operative to collect rain and or sprinkler water for moistening the pot soil.

3,618,261

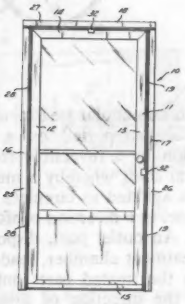
PRE-HUNG DOOR ASSEMBLY

Richard L. Torbett, Gnadenhutten, Ohio, assignor to Harvard Industries, Inc.

Filed May 27, 1970, Ser. No. 41,037

Int. Cl. E06b 3/32

U.S. Cl. 49—380 6 Claims



A preassembled door having an outer frame which consists of a top Z-bar or header and side Z-bars and having a door hinged to one of the side Z-bars. The other side Z-bar is connected to the door by severable fastening members and is spaced from the door by removable spacer members. The side Z-bars are fixed at their upper ends to the header by tabs which project downwardly from the header and by strips of pressure-sensitive tape which extend around the intersection of the outside surfaces of the portions of the top Z-bar and the side Z-bars which form lintel and jamb surfaces for the door.

3,618,262

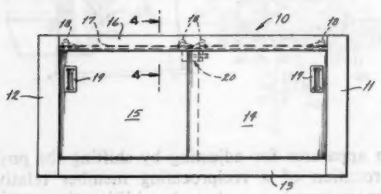
BY-PASSING DOOR CLOSER

Albert P. Tuhro, St. Louis, Mo., assignor to Southern Equipment Company, St. Louis, Mo.

Filed Mar. 13, 1970, Ser. No. 19,291

Int. Cl. E05d 15/06

U.S. Cl. 49—404 3 Claims



Door closing means for by-passing doors on cabinets, closets, storage chests and the like in which at least a pair of doors movable in by-passing relation are resiliently urged into closed positions by a common closing device which operates to allow either door to be moved to open position.

3,618,263

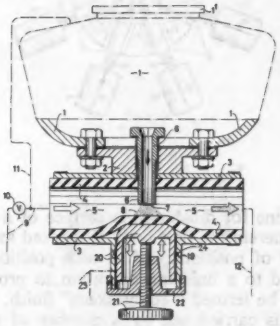
SANDBLASTING INSTALLATION

Per Torsten-Weijsenburg, Solna, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jan. 28, 1969, Ser. No. 794,522

Int. Cl. B24c 3/04

U.S. Cl. 51—8 8 Claims



A sand and air mixing chamber in a sandblasting installation has a sand feed tube extending thereinto from above and a bottom portion, which is vertically adjustable towards and away from the lower outlet end of said feed tube.

3,618,264

BURRING DEVICE FOR TOOTHED WORKPIECES

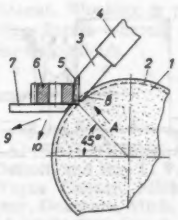
Günter Holl, Kemptener-Strasse 29, Lindau (Bodensee), Germany

Filed Dec. 3, 1968, Ser. No. 780,772

Claims priority, application Germany, Feb. 19, 1968, P 16 52 799.4

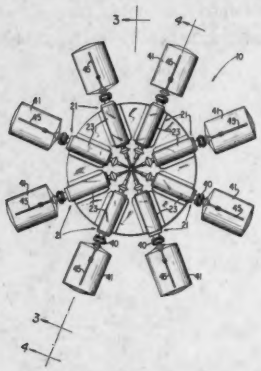
Int. Cl. B23f 19/12

U.S. Cl. 51—95 GH 3 Claims



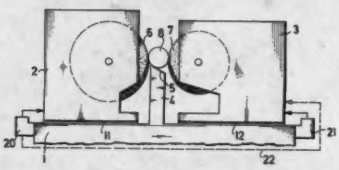
This invention relates to a burring device for toothed workpieces, such as gear wheels or the like, of the kind comprising a profiled rotary tool having a cutting action and the axis of which is disposed horizontally, a support table for the workpiece to be burred, and an abutment for the workpiece.

3,618,265
FINISHING MACHINE FOR METAL SURFACES
Paul B. Croop, Ilion, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.
Filed Jan. 8, 1969, Ser. No. 789,894
Int. Cl. B24b *5/00*
U.S. Cl. 51—111 15 Claims



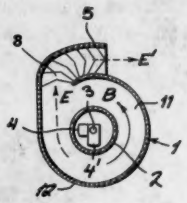
A machine for finishing the surface of a bolt body or the like wherein the bolt body is indexed axially through a plurality of positions and in each position the surface is subjected to a finishing operation to produce a finish which can be termed a "damaskeen" finish. The finishing operation is carried out by a number of abrasive rods mounted in rotating spindles with the spindles being positioned for reciprocating movement in directions radially or perpendicularly to the bolt body. A rotating drive shaft acts through cam means to reciprocate the spindles according to a predetermined pattern. The drive shaft is also connected through a drive arrangement which intermittently rotates a gear held against axial movement and threadedly engaged with an index spindle so that the index spindle which grips the bolt body is indexed axially in step-wise movements.

3,618,266
CENTERLESS CIRCULAR GRINDER
Erich Rotzoll, Hannover-Kirchrode, Germany, assignor to Herminghausen-Werke GmbH, Hannover, Germany
Filed Mar. 14, 1969, Ser. No. 807,361
Claims priority, application Germany, Mar. 14, 1968, P 16 52 066.4
Int. Cl. B24b *5/18*
U.S. Cl. 51—103 R 5 Claims



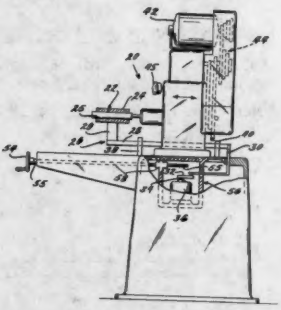
Improved centerless circular grinder assembly, control mechanism, drive, and method of operation for high output grinding in which the basic units (grinding wheel, regulating wheel and workholder) are controllably movable with relation to each other during grinding to permit high radial removals of material to smaller finished workpiece diameter.

3,618,267
TUMBLING MACHINE WITH AUTOMATIC DISCHARGE
Ernst Huber, 30 Lagernstrasse, 8037 Zurich, Switzerland, and Simon Jacot, 10 Mazzinistrasse, 2540 Grenchen, Switzerland
Filed Apr. 14, 1970, Ser. No. 29,105
Claims priority, application Switzerland, May 2, 1969, 6,865/69
Int. Cl. B24b *31/06;* B01f *11/00*
U.S. Cl. 51—163 9 Claims



A vessel with an annular treatment chamber, resiliently and nonrotatably supported on a platform, is set in wobbling motion by a reversibly rotatable, eccentrically weighted central shaft whereby a mass of mobile parts in the chamber is agitated to circulate along the circumference of the vessel in a direction conforming to the sense of shaft rotation. An outlet port, disposed tangentially in a wall of the treatment chamber, leads to a discharge duct which receives the treated parts only when the sense of rotation is in the direction of divergence of the outlet port from the treatment chamber; the discharge duct may include a screening section for the separation of larger and smaller parts, with return of either fraction to the treatment chamber.

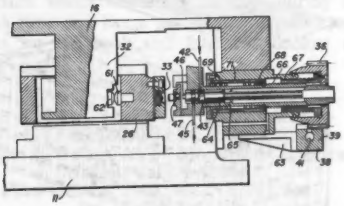
3,618,268
STROKE POSITION CONTROL MEANS
Joseph Sunnen, 400 S. Warson Road, Ladue, Mo. 63124
Filed Sept. 4, 1969, Ser. No. 855,212
Int. Cl. B24b *49/16*
U.S. Cl. 51—165 R 15 Claims



An apparatus for adjusting by shifting the position of reciprocation of a reciprocating member relative to a stationary member, such as by shifting the position of a rotating and/or reciprocating working member or of a workpiece being honed thereby to correct for inaccuracies in the surface being honed. The subject apparatus includes

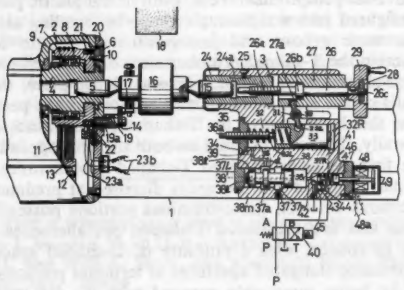
means for sensing the instantaneous load and changes therein required to to rotate the honing head and for producing therefrom control signals which are used to indicate and/or to operate means that shift or relocate the position of the stroke pattern of one member relative to the other in a direction to compensate for load variations sensed and to correct the inaccuracies that caused the load to vary.

3,618,269
GRINDING MACHINE
Edward G. Robillard, Cherry Valley, Herbert R. Uhtenwoldt, Worcester, and Paul A. Leppanen, Gardner, Mass., assignors to The Heald Machine Company, Worcester, Mass.
Filed Aug. 1, 1969, Ser. No. 846,901
Int. Cl. B24b *49/08*
U.S. Cl. 51—165.9 **5 Claims**



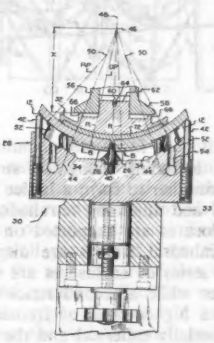
This invention relates to a grinding machine and, more particularly, to apparatus for finishing surfaces of revolution by the abrasive process, wherein the forces between the abrasive wheel and the workpiece are maintained at accurately-determined levels.

3,618,270
LATHE WITH TORQUE RESPONSIVE PRESSURE ADJUSTMENT
Tsuyoshi Koide, Kariya-shi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan
Filed June 19, 1970, Ser. No. 47,796
Claims priority, application Japan, July 3, 1969, 44/52,973
Int. Cl. B24b *5/02*; B23b *19/02*
U.S. Cl. 51—237 **8 Claims**



A device for supporting a workpiece between a head stock center and a tail stock center comprises an electric gauge responsive to the cutting resistance of the workpiece, a control circuit to convert the output of the electric gauge into an electrical output, means to apply fluid pressure to the tail stock center and an electro-fluid pressure converting means responsive to the output from the control circuit to vary the fluid pressure applied to the tail stock center in accordance with the variation in the cutting resistance whereby to apply holding pressure commensurate with the cutting resistance to the workpiece by the tail stock center.

3,618,271
MULTIFOCAL LENS MANUFACTURING PROCESS AND APPARATUS
Paul Martiros, Cherry Valley, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 15, 1969, Ser. No. 857,784
Int. Cl. B24b *19/00*
U.S. Cl. 51—277 **15 Claims**



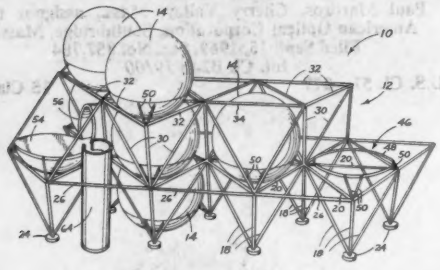
Multifocal lenses formed of one-piece molded or pressed meniscus lens blanks. An optically finished surface of a curvature desired for near-vision fields of the lenses is produced on a substantial portion of one unfinished side of each of a number of the blanks with a straight cliff-like line of division separating the optically finished and unfinished portions of said sides of the blanks. With referencing from the finished portions of the blanks, they are multiply blocked and revolved about an axis radially spaced from their finished portions a distance equal to a radius of curvature desired upon the unfinished portions less an amount equal to a practical minimum of height to which the cliff-like lines of division are to be reduced. Grinding and polishing to the minimum height of the lines of division during such revolution finishes the blanks. Blocking is performed with an aligning and holding fixture wherein the blanks are supported by their near-vision fields.

3,618,272
PROCESS FOR LAPPING HYPOID GEARSETS
Thomas J. Whalen, Detroit, and Roy L. Van Alsten, Redford Township, Wayne County, Mich., assignors to Ford Motor Company, Dearborn, Mich.
No Drawing. Original application Oct. 8, 1965, Ser. No. 494,246, now Patent No. 3,462,251, dated Aug. 19, 1969. Divided and this application Sept. 19, 1968, Ser. No. 788,355
Int. Cl. B24b *1/00, 3/00*
U.S. Cl. 51—281 **5 Claims**

Gear teeth of automotive hypoid gear sets are lapped with an aqueous base lapping composition. The lapping composition is applied continuously while driving one

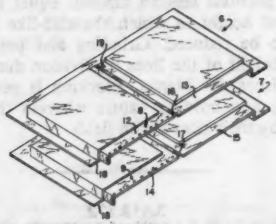
member of the gear set and braking the other member. An inexpensive and non-hazardous aqueous solution is used to remove lapping composition after the lapping operation.

3,618,273
BUILDING CONSTRUCTION
George M. Crandall, Portland, Oreg., assignor to Geonetics, Inc., Portland, Oreg.
Filed July 2, 1969, Ser. No. 838,427
Int. Cl. E04h 1/12, 9/06
U.S. Cl. 52—79 13 Claims



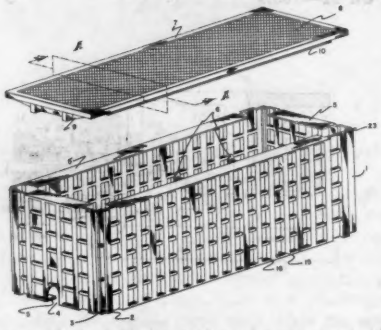
A building including elongated structural members joined to one another to form a lattice structure defining interconnected and adjoining tetrahedral frames. Modular space enclosures are supported on the lattice structure. The tetrahedral frames are disposed in multiple levels. A first series of enclosures are supported on one level of frames while a second series of enclosures are supported on a higher level of frames. The enclosures may be substantially spherical and the lower extremities of the enclosures in the second series nest between the upper extremities of the enclosures in the first series.

3,618,274
VARIABLE DIMENSION DOOR LINER PANEL
Harold E. Vickerman, Milwaukee, Wis., assignor to The General Tire & Rubber Company, Akron, Ohio
Filed Jan. 16, 1970, Ser. No. 3,325
Int. Cl. B61d 17/18
U.S. Cl. 52—98 4 Claims



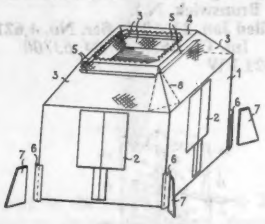
A door liner, such as would be employed on railroad refrigerator cars is formed of two half panels which are fabricated in the same mold and may be joined in a lap joint splice along a horizontal center line of the panel. The lap joint splice is provided by complementary, offset, lap joint edges, with each half panel overlapping part of the offset lap joint edge of the other. The half panels have center channels along their vertical center lines, the channels having a central offset to divide the channels into two levels. In order to vary the width of the door liner, each half panel is sawed into two quarter panels along the offset in the center channels, thus forming lap joint edges which may be overlapped and joined as with the horizontal lap joints to form the full door liner.

3,618,275
COLLAPSIBLE HOUSING FOR ELECTRICAL GOODS
Louis Ance, Hickory, N.C., assignor to Superior Continental Corporation, Hickory, N.C.
Filed Nov. 12, 1969, Ser. No. 875,985
Int. Cl. B65d 7/12, 7/28, 7/46
U.S. Cl. 52—169 16 Claims



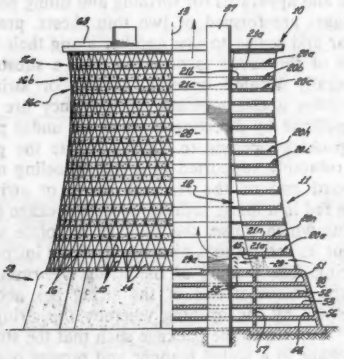
Disclosed herein is a housing, which is essentially a box adapted for containing electrical apparatus while both box and the apparatus are buried in the ground during service. The instant housing is a weather-resisting container adapted for ready assembly and disassembly by a sole workman, this knockdown feature being advantageous in that it facilitates shipment of the housing from place to place with a minimum of occupied volume. Making up the housing are two rectilinear pieces of plastic material, each having a series of slots aligned along one terminal portion thereof and a corresponding series of upstanding aligned T-shaped protuberances disposed along an opposite terminal portion, the longitudinal dimension of the uppermost portion of the T-shaped protuberances being larger than the largest dimension of the slots. Each of the pieces of plastic have a transverse groove running parallel to those terminal portions possessing the slots and T-shaped protuberances. Both of the plastic pieces are configured into a right-angle shape by bending along the transverse groove and juxtapositioned one to another wherein the T-shaped protuberances of one such piece are aligned with the slots of a second plastic piece, the sidewalls of the slots mechanically engaged in the perpendicular shank portions of the T-shaped protuberances. Additionally, there are disposed on both surfaces opposite from the first-mentioned aligned T-shaped protuberances additional T-shaped protuberances disposed at predetermined locations between those terminal portions possessing the slots and first-mentioned T-shaped protuberances. These act in concert with a plurality of U-shaped spacer bars possessing elongated apertures at terminal portions thereof by being removably engaged with the last-mentioned T-shaped protuberances. In service, a weather-proof splice case, having therein at least two insulated electrical conductors in electrical and mechanical connection, is placed on the spacer bars with the insulated electrical conductors being let out through an opening in the bottom of one of the sidewalls of the housing.

3,618,276
BALLOON-LAUNCHING STRUCTURE
René R. Vielle and René Chevallier, Courbevoie, France, assignors to Sonectro Societe d'Entreprises Generales et Electroniques
Filed May 4, 1970, Ser. No. 34,097
Claims priority, application France, May 27, 1969, 6917471
Int. Cl. E04d *13/00*
U.S. Cl. 52—173 12 Claims



A structure which shelters a balloon during launch preparation time and has a gate in each wall, openwork windbreaks on the roof and lateral deflectors at the corners.

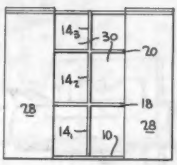
3,618,277
HYPERBOLOID BUILDINGS
Terrance J. Waters, 33560 Mulholland Highway, Malibu, Calif. 90265
Filed Oct. 10, 1969, Ser. No. 865,248
Int. Cl. E04b *1/34*
U.S. Cl. 52—175 16 Claims



A building comprises outer and inner frameworks having vertical axes which approximately coincide, the frameworks being spaced from one another and at least one is generally hyperboloidal; and modular means interconnects the frameworks at different elevations. No supporting columns are required, and the building is extremely stable and lends itself to extensive use of prefabricated structural elements.

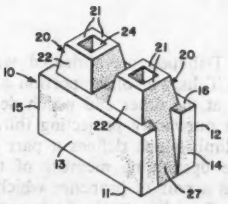
3,618,278
MULTIPLE STORY MULTIPLE UNIT BUILDING
William J. Mouton, Jr., P.O. Box 10515, New Orleans, La. 70121, and Will A. Stacy, 604 Mansfield Road, Silver Spring, Md. 20910
Filed May 8, 1970, Ser. No. 35,656
Int. Cl. E04f *11/00*; E04h *1/04*
U.S. Cl. 52—185 10 Claims

A multiple story multiple unit building in which each unit is constructed of predominantly rectangular precast semi-lightweight structural concrete panels which preferably are prestressed, of uniform thickness, and free of any openings or apertures, whereby they may readily be formed by generally accepted conventional concrete precasting practice in a continuous casting or extrusion operation and without the need for incorporating special joint constructions or connecting means in the respective panels. Each unit comprises at least several relatively parallel multi-story walls which are formed by monolithic wall panels extending continuously from end to end of the unit. Each of the upper floors is comprised by a pair of monolithic floor panels, each coextensive in width with the unit and extending between and supported on the wall panels, the two floor panels of each floor being relatively spaced apart longitudinally of the unit to provide an opening which receives a prefabricated multi-story utility capsule or core containing the various kitchen, bathroom,



heating, air conditioning, electrical and other equipment. Monolithic rigid stabilizer panels coextensive in height with the building unit, are located at either end of the unit in spaced apart relation to provide a multi-story window and doors openings, and are fixedly connected to the respective wall panels and floor slabs to impart lateral stability to the unit. The roof also with the width of the building and spanning all of the walls thereof to be supported on the upper edges of said walls. The interconnections between the various panels and slabs may be simply achieved by conventional expansion bolts, without necessity for provision of special joint configurations or inserts for connecting purposes. Precast unitary stair flights extending diagonally between the base slab and walls as well as directly between the walls during the erection thereof as well as thereafter.

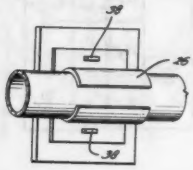
3,618,279
BUILDING BLOCK
True F. Sease, R.R. 3, Airhill Road, Brookville, Ohio 54309
Continuation of application Ser. No. 801,437, Feb. 24, 1969. This application Oct. 26, 1970, Ser. No. 84,189
Int. Cl. E04b *2/20*; E04c *1/10*
U.S. Cl. 52—227 10 Claims



A building block having male and female portions adapted to hold a series of blocks in interconnecting relation, with or without the use of mortar, which can be established with a minimum requirement of labor skill in a minimum of time. Each block includes a body having substantially flat top and bottom surfaces with vertical

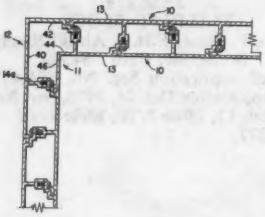
sides and having hollow truncated pyramidal projections of rectangular cross sections extending through the central portion of the block from the bottom wall to a position substantially equal to one half the height of the body and a cavity within the body which extends upwardly from the bottom surface to receive one of the projections from a lower course of blocks. A tie rod, a wire clip, or tie cables may also be used to hold the blocks in place.

3,618,280
BUILDING STRUCTURE
Ruble G. Langston, College Station, Tex., assignor to Hanover Modular Homes International Inc., College Station, Tex.
Filed July 22, 1969, Ser. No. 843,632
Int. Cl. E04h *1/12;* **E04b** *2/58*
U.S. Cl. 52—309 **9 Claims**



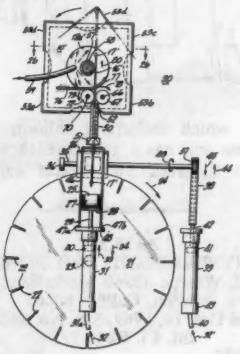
A building structure which can be made in modular units with each unit having a welded pipe frame and both interior and exterior surfacing materials secured to the frame by acrylonitrile butadiene styrene clips having a C-shaped portion to engage the pipe frame and a flat surface to be bonded directly to the surfacing materials or to nailing boards to which the surfacing materials may be secured.

3,618,281
PANEL CONSTRUCTION
Arnold E. Hill and Howard G. Hill, both of 130 Hogarth Ave., Toronto, Ontario, Canada
Filed Feb. 2, 1970, Ser. No. 7,920
Int. Cl. E04c *1/10, 1/12, 2/46*
U.S. Cl. 52—404 **4 Claims**



A generally T-shaped prefabricated wall panel. The crossbar of the T has an offset portion at one end and a pair of limbs at the other end which define a continuous groove. An outwardly projecting third limb is connected to one limb which defines a part of the groove. The end of the upstanding member of the T opposite the crossbar has a pair of branches which define a continuous groove. Two like wall panels are joined by inserting the offset portion of one panel into the groove defined by the pair of limbs of the other panel. When the panels are so joined, their crossbars are in the same plane. A third like panel is connected to the first two panels by contacting the third limb of the third panel to the groove defined by the pair of branches of any one of the other two panels, then screwing or spot welding the contacting surfaces together. When the third panel is so connected, its crossbar defines a wall parallel to and spaced apart from the wall defined by the crossbars of the first two panels.

3,618,282
PACKAGING APPARATUS AND METHOD
Herbert Hagel, Mountainside, and Zsolt T. Vigh, Woodbridge, N.J., assignors to National Musical String Company, New Brunswick, N.J.
Filed Jan. 21, 1970, Ser. No. 4,621
Int. Cl. B65b *43/04, 63/00*
U.S. Cl. 53—21 FW **16 Claims**

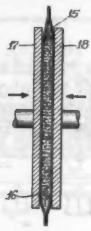


Method and apparatus for forming and filling packages. The packages are formed of two thin sheets, preferably rectangular and sealed to one another along their peripheries. One of the sheets is provided with a substantially large centrally located opening. Strings or string like devices having a characteristic of resiliency are loaded into the package by directing a jet of air under pressure into the package opening to slightly inflate the package which is rotatably supported in a free-wheeling manner. The forward end of the resilient string or string like member is fed in a linear fashion into the package through the opening which causes the package to rotate substantially about its central axis as a result of the introduction of the string. The feeding of the string is terminated as soon as the rearward end of the string lies above the region defined by the opening whereby the string is released to "snap" in to the package such that the string lies in the package in a coiled manner and presses outwardly against the marginal seal of the package. The contents of the package are completely sealed by sealing the marginal region defined by the package opening to the other sheet forming the package. Method and apparatus for forming the package, filling the package and finally, sealing the package are described herein.

3,618,283
METHOD FOR STERILE PACKAGING OF ARTICLES
Francis C. Moore and Leon R. Perkinson, Indianapolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.
Continuation-in-part of application Ser. No. 788,480, Jan. 2, 1969, which is a continuation-in-part of application Ser. No. 725,826, May 1, 1968. This application Nov. 4, 1969, Ser. No. 873,786
Int. Cl. B65b *55/14, 55/18*
U.S. Cl. 53—21 FC **26 Claims**

A quantity of solution having a known concentration of one of a group of antiseptic agents is sealed together with the article to be sterilized in a flexible, air-tight

container; and then the article and container are worked so that the antiseptic solution saturates the exposed surfaces of the article and contacts the entire interior surface of the container. The entire package is then heated



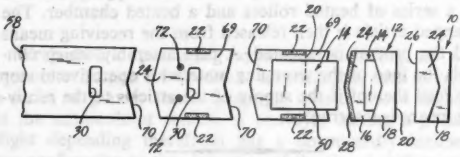
to a temperature in the range 120° F. to 212° F. for a period of three to twenty-four hours, depending on the agent used, and sufficient to kill all bacteria, fungi, and spores in the package.

3,618,284

METHOD FOR MAKING ENVELOPE CONTAINING RETURN ENVELOPE STRUCTURE

Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Mar. 23, 1970, Ser. No. 21,926
Int. Cl. B65b *35/50, 61/26, 63/04*
U.S. Cl. 53—23 **15 Claims**



An envelope assembly comprising a main envelope and a return envelope structure contained in said main envelope and made from two continuously moving webs of sheet material. A partially folded return envelope structure which includes a return envelope and one or more attached coupons is cut from one web and positioned on an associated main envelope blank cut from the other web and moving in synchronism therewith. The main envelope blank and the return envelope structure are simultaneously folded onto themselves along at least one common fold line and associated marginal portions of the blank are connected in face-to-face relation to form a main envelope pocket containing the return envelope structure. The name and address of the recipient is imprinted on the return envelope through a window in the main envelope. The return envelope may be of open-side or open-end type.

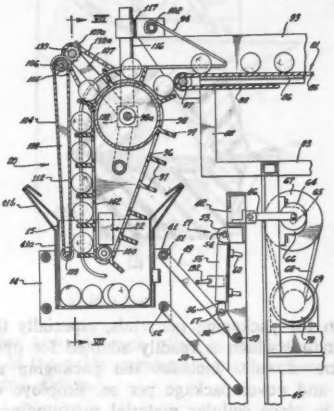
3,618,285

METHOD FOR FILLING BOXES WITH A PRESELECTED QUANTITY OF DISCRETE ARTICLES

Kenneth F. Russell, Pomona, Calif., assignor to Brogdex Company, Pomona, Calif.

Original application July 13, 1967, Ser. No. 653,239, now Patent No. 3,492,779, dated Feb. 3, 1970. Divided and this application June 2, 1969, Ser. No. 862,543
Int. Cl. B65b *35/00, 5/08, 57/00*
U.S. Cl. 53—26 **4 Claims**

A method for filling a box with a preselected aggregate number of articles or a preselected aggregate weight of articles utilizing a vertical feed conveyor having a bottom article release end received within a box being filled to minimize the distance a released article falls to the bottom of the box or to a layer of articles already deposited in the box. The box is raised to enclose the release end of the vertical feed conveyor and as each article is deposited in the box it is counted. At a preselected intermediate count of articles the box is incrementally lowered a selected ver-



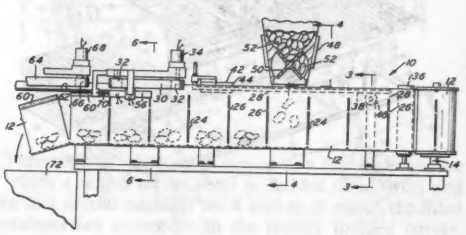
tical interval to provide space for additional articles. In a second example of the invention, the weight of each article as it is placed in the box is sensed and upon reaching a preselected intermediate weight, the box is incrementally lowered a selected vertical interval. Means are provided for shaking the box during the filling operation to settle and closely arrange the articles in the box.

3,618,286

BAG FILLING, SEALING AND SEPARATING SYSTEM

Hercules Membrino, 1934 Arch St., Philadelphia, Pa. 19103

Filed June 8, 1970, Ser. No. 44,186
Int. Cl. B65b *43/00*
U.S. Cl. 53—29 **11 Claims**



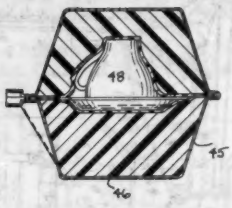
Thermoplastic bags formed in a strip, the bags being separated from each other in the strip by lines of seal and severance, each of these lines having at least one unsevered interruption therein, these interruptions forming connections between the bags, and systems for filling, sealing and separating the bags from each other, such systems including means for conveying the strip of bags below a filling hopper and then past a heat sealing means where the filled bags are sealed prior to separation from each other.

3,618,287

FOAM PACKAGING METHOD

Cavas M. Goghai, Cambridge, Mass., Charles R. Sperry, Providence, R. I., and Henry A. Hill, Watertown, Awbrey C. Laws, Cambridge, Philip B. Wainwright, Squantum, Peter A. Latham, Newburyport, and Paul E. Brefka, Southboro, Mass., assignors to Synectics Development Corporation, Cambridge, Mass.

Filed Oct. 14, 1969, Ser. No. 866,209
Int. Cl. B65b *17/00, 23/00, 33/00*
U.S. Cl. 53—36 2 Claims



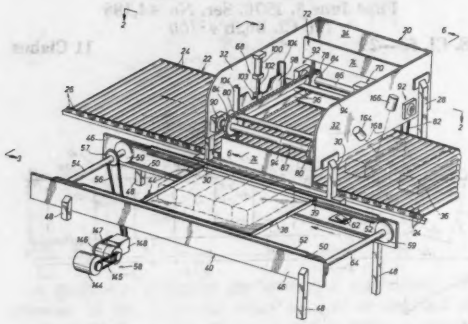
System for packaging materials, especially those of a fragile nature which is readily adapted for operation at the point of sale. Includes the packaging apparatus, method and novel package per se. Employs controlled foamed in place cellular material surrounding the item to be packaged. Package is formed of two segments. Apparatus includes a readily controllable filling mechanism for inserting foam precursor materials into the package segments.

3,618,288

AUTOMATIC TRAY LOADING APPARATUS

Ronald L. Thornton, Portland, Oreg., and David D. Leahy, Corpus Christi, Tex., assignors to Clayton Specialties, Inc., Corpus Christi, Tex.

Filed May 1, 1970, Ser. No. 33,787
Int. Cl. B65b *57/06, 57/20*
U.S. Cl. 53—55 23 Claims



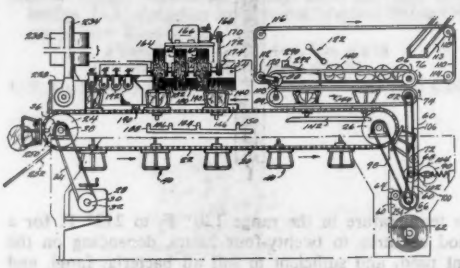
In one exemplar form, an automatic chain driven transfer apparatus for moving packaged bakery products temporarily arrested on a continuously moving power free roller conveyor transversely to the direction of conveyor movement to a loading tray spaced adjacent the transfer apparatus and parallel to the moving conveyor. A loading tray is automatically indexed to its proper position by the action of a controlled tray conveyor, the operation of which is controlled by the transfer apparatus control circuit.

3,618,289

AUTOMATIC WRAPPING APPARATUS

Fritz Wach, Robert A. Stratton, and Lawrence G. Cook, Yuma, Ariz., assignors to Wastron Developments, Incorporated, Yuma, Ariz.

Filed Jan. 31, 1969, Ser. No. 795,407
Int. Cl. B65b *11/54, 41/16, 49/06*
U.S. Cl. 53—64 30 Claims



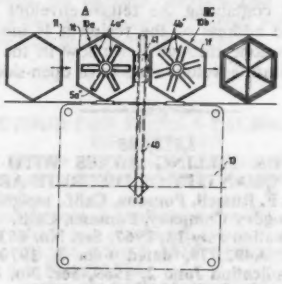
Apparatus for automatically wrapping articles with flexible material and for sealing the wrapping material after the article has been fully wrapped. Means for receiving the articles to be wrapped are mounted on an endless conveyer and the wrapping material is automatically supplied adjacent to the receiving means so that the articles drop onto severable portions of the wrapping and therewith into the receiving means. The partially wrapped articles are then passed under brushes which force the wrapping material down onto the surface of the article following which the wrapping is sealed by a series of heated rollers and a heated chamber. The wrapped article is then released from the receiving means and the process is repeated. A cam assembly which controls the feed of the wrapping material is operative to stop the feed thereof if the supply of the articles to the receiving means is interrupted.

3,618,290

MEANS FOR FEEDING TETRAHEDRAL PACKAGES INTO A TRANSPORT CONTAINER

Johan Vilhelm R. Delme, Lund, Sweden, assignor to AB Tetra Pak, Lund, Sweden

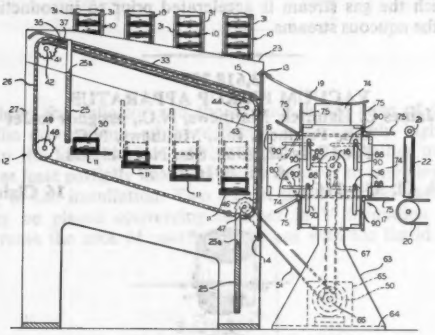
Original application Aug. 24, 1967, Ser. No. 663,362, now Patent No. 3,495,377, dated Feb. 17, 1970. Divided and this application May 8, 1969, Ser. No. 862,540
Claims priority, application Sweden, Sept. 23, 1966, 12,815/66
Int. Cl. B65b *35/32, 35/56*
U.S. Cl. 53—142 9 Claims



Apparatus to feed tetrahedron shaped packages into a transport container that is substantially symmetrical about a central vertical axis. The transport container is

preferably hexagonal and the apparatus includes a tetrahedron holder which has two spaced apart legs through which one of the transverse seals of the tetrahedron package projects to support the container. The holder is hinged to allow the holder to drop downward to allow the tetrahedrons to drop into the transport container.

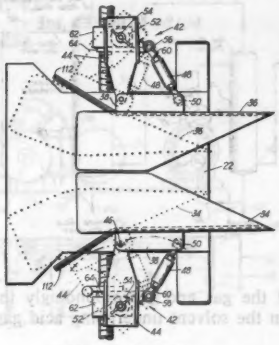
3,618,291
WRAP-AROUND PACKAGING APPARATUS
Charles H. Krebs, 321 Cowesett Ave., West Warwick, R.I. 02893
Filed Dec. 8, 1969, Ser. No. 883,033
Int. Cl. B65b *11/38, 35/50;* **B65g** *57/11*
U.S. Cl. 53—159 **21 Claims**



Wrap-around packaging apparatus including an accumulator station for articles to be packaged, such as cans, a series of gravity chutes to supply cans to tiered shelves in the accumulator station. A conveyor having a pusher flight depending therefrom has a downwardly inclined run conforming to the elevations of the tiered shelves and drives the flight in a downwardly inclined direction to stack the cans on the rearwardmost shelf on top of those on the next forwardly spaced shelf and pushes the stacked cans into a blank carried by a blank guide at the front of the accumulator station. A rotatable packaging unit is disposed in front of the blank guide and has diametrically opposed back-up members backing up a blank and articles to be stacked as pushed against said back-up member. Folders are carried by the packaging unit and are actuated by the back-up member to fold the blank about the article. The packaging unit is rotated in steps of 90° with a dwell at each step, and positions the package into a horizontal position where the lid is folded over the top of the package and then into a vertical position where the back-up member actuated by the pusher ejects the package past folding plows, folding and sealing the lid to the side and front of the package.

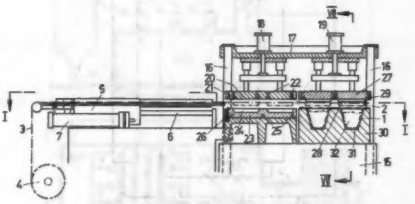
3,618,292
GUIDE MECHANISM FOR PACKAGING MACHINE
Robert E. Rademacher, Richmond, Va., assignor to AMF Incorporated
Filed Dec. 10, 1969, Ser. No. 883,960
Int. Cl. B65b *39/00*
U.S. Cl. 53—257 **9 Claims**

In a packaging apparatus wherein a succession of open bags are provided at a packaging station and pusher means engage articles to be packaged and insert them into said open bags, a guide mechanism for said apparatus, which comprises opposed guide members, means pivotally mounting said guide members for movement towards and away from the packaging station, means modifying said pivotal mounting means such that movement of the guide



member tips towards each other is limited during the movement of the guide members towards and away from the packaging station.

3,618,293
MACHINE FOR SEALING CONTAINERS WITH COVERS MOLDER FROM SYNTHETIC PLASTIC SHEET
Horst Loewenthal, Tiengen, Germany, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed July 25, 1969, Ser. No. 845,007
Claims priority, application Switzerland, July 31, 1968, 11,456/68
Int. Cl. B65b *7/28, 3/02*
U.S. Cl. 53—296 **2 Claims**

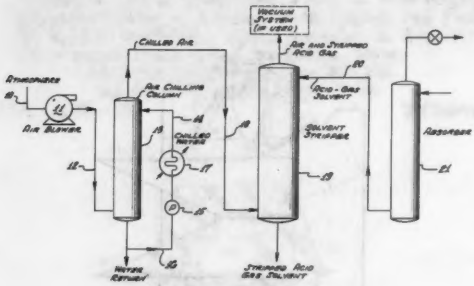


Thermoplastic sheeting is moved to a first work station at which a length of the sheet is molded into covers and then to a second adjacent work station at which the filled containers are covered with the freshly molded covers, which heating elements immediately weld to the containers.

3,618,294
METHOD FOR REDUCING THE WATER CONTENT OF REFINERY COLUMN STRIPPING GASES
Robert N. Tennyson, Anaheim, Calif., assignor to The Fluor Corporation Ltd., Los Angeles, Calif.
Filed Apr. 18, 1969, Ser. No. 817,334
Int. Cl. B01d *53/26*
U.S. Cl. 55—29 **10 Claims**

Moisture absorption in hygroscopic physical solvents for acid gases regenerated by stripping with air or inert

gas, is reduced by preliminarily contacting the stripping gas with chilled water to lower significantly the moisture



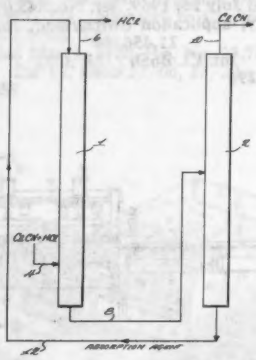
content of the gas and correspondingly the presence of moisture in the solvent undergoing acid gas stripping.

3,618,295

PROCESS FOR THE SEPARATION OF CYANOGEN CHLORIDE AND HYDROGEN CHLORIDE

Friedhelm Geiger, Offenbach am Main, Theodor Lüssling, Grossauheim, and Wolfgang Weigert, Offenbach am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Nov. 14, 1969, Ser. No. 876,736
Claims priority, application Germany, Nov. 19, 1968, P 18 09 607.6
Int. Cl. B01d *53/16*
U.S. Cl. 55—71 10 Claims



A mixture of cyanogen chloride and hydrogen chloride is separated by means of organic liquid in which the cyanogen chloride is absorbed but in which the hydrogen chloride is insoluble.

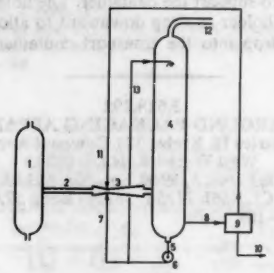
3,618,296

METHOD FOR THE SEPARATION OF CARBON FROM SYNTHESIS GAS UNDER HIGH PRESSURE

Werner Auer, Heidelberg, Heinz Hauser, Limburgerhof, and Walter Knobloch, Mannheim, Germany, assignors to Texaco Development Corporation, New York, N.Y.

Filed July 18, 1969, Ser. No. 843,008
Int. Cl. B01d *47/00*
U.S. Cl. 55—93 3 Claims

Synthesis gas obtained by partial oxidation of liquid hydrocarbons at high pressure and containing entrained by-product carbon and metal salts is contacted with separately introduced streams of acidic carbon-containing water and alkaline clear water in a contacting device in



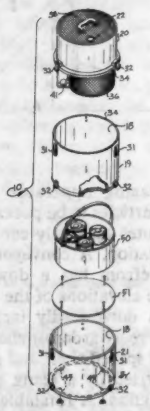
which the gas stream is accelerated prior to introduction of the aqueous streams.

3,618,297

VACUUM PICKUP APPARATUS

James C. Hamrick, Matthews, N.C., assignor to Jet Line Products, Inc., Matthews, N.C.

Filed July 22, 1969, Ser. No. 843,364
Int. Cl. B01d *50/00*
U.S. Cl. 55—216 16 Claims



A vacuum pickup apparatus in which a stream of air and entrained material flowing into an expansion and material collection chamber strikes a concave surface flow obstruction and is divided into two portions directed on oppositely turning courses of flow for dissipation of the kinetic energy of the inflowing air and entrained material by impingement of the portions first against the obstruction and then against each other within the chamber. The capacity of the material collection chamber may be varied by selective arrangement and interconnection of three housing members included in the vacuum pickup apparatus.

3,618,298

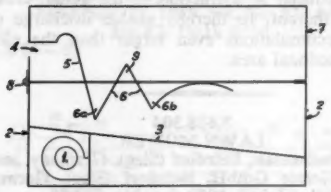
SYSTEM FOR PURIFYING A PARTICLE-LADEN GASEOUS STREAM

Jacques Curchod, Mont-sur-Rolle, Switzerland, assignor to Curchod Baeriswyl & Cie S.A., Rolle, Switzerland

Continuation-in-part of application Ser. No. 781,905, Dec. 6, 1968. This application Apr. 6, 1970, Ser. No. 26,041
Claims priority, application Switzerland, Apr. 26, 1968, 6,192/68
Int. Cl. B01f *3/04*
U.S. Cl. 55—226 7 Claims

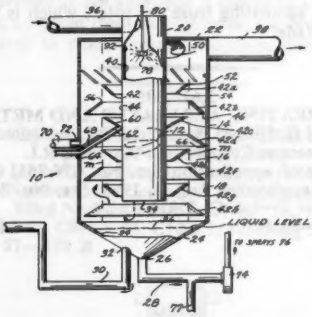
An installation for purifying a particle-laden gas stream comprises an enclosure partially fillable with

liquid to a certain level when the installation is at rest. An inlet and outlet are located above that level and the outlet co-operates with suction means for drawing a gaseous stream. A deflector having a lower surface below said certain level is located between the inlet and outlet so as to direct a gas stream on to the liquid approximately perpendicular to the surface thereof. A saw-tooth baffle



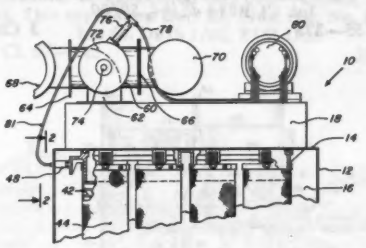
follows the deflector and the or each lower edge of the baffle downstream of the deflector is sucessively higher than the lower surface of the deflector. The baffles may be at least partially fixed to a movable cover to ease cleaning of the installation. Two sets of deflectors and baffles may be placed converging together in V formation to increase the area of contact of the gas with the liquid.

3,618,299
GAS CLEANING APPARATUS
Daniel B. Vincent, 2608 Watrous Ave., Tampa, Fla. 33609
Filed Apr. 1, 1969, Ser. No. 812,467
Int. Cl. B01d *47/06*
U.S. Cl. 55—236 **4 Claims**



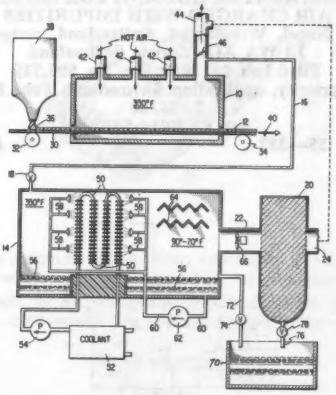
Exhaust gases containing entrained particles are led centrifugally, and downwardly in a cylindrical vessel provided with a liquid spray. Passing out of the lower end of the first vessel, the gases travel up the annulus between that vessel and a larger cylindrical vessel. The annulus is provided with frusto-conical baffles wet by liquid sprays and serve to change direction of gas flow and to throw liquid with entrained particles toward the inner and outer walls of the annulus where falling films result. The liquid for the upper few baffles is preferably water and for the lower baffles, thin liquor. Two adjacent intermediate baffles extend to the respective sidewalls for draining the fresh water washing zone.

3,618,300
DUST COLLECTION
Josef Pausch, Hopkins, Minn., assignor to Aerodyne Machinery Corporation, Hopkins, Minn.
Continuation of application Ser. No. 619,868, Mar. 1, 1967, which is a continuation of application Ser. No. 372,242, June 3, 1964. This application Dec. 2, 1968, Ser. No. 781,702
Int. Cl. B01d *46/04*
U.S. Cl. 55—273 **2 Claims**



A dust filtering system in which the flexible porous filtering surface is supported on a skeletal frame, and in which the skeletal frame is resiliently mounted so that vibrational movement imparted thereto may be transmitted in a relatively undampened condition to all portions of the porous filtering surface.

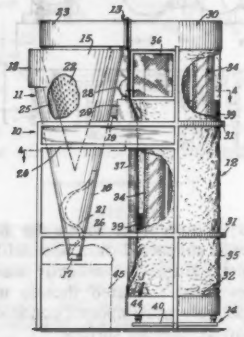
3,618,301
PROCESS AND APPARATUS FOR REMOVING AIR POLLUTANTS FROM OVEN-STACK EMISSIONS
Norman J. Handman, Cherry Hill, N.J., assignor to Clermont Engineering Company, Incorporated
Filed Mar. 11, 1969, Ser. No. 806,155
Int. Cl. B01d *47/06*
U.S. Cl. 55—89 **4 Claims**



A system for preventing hot noxious vapors, comprising aerosols of organic materials emanating from an oven in a manufacturing process, from polluting the atmosphere through oven-stack emissions comprises a spray chamber, finned cooling coils disposed within the spray chamber, and a mist eliminator communicating with the spray chamber. Hot gases emanating from the oven are cooled by the finned coils to provide a two-phase liquid condensate in the spray chamber. The finned coils are sprayed by the two-phase condensate, at high pressure,

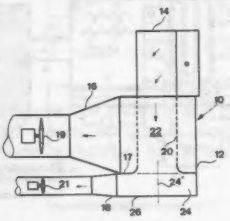
to scrub and clean the finned coils of accumulated tars and to agglomerate the aerosols in the spray chamber. Any aerosols emanating from the spray chamber are filtered by the mist eliminator.

3,618,302
UNITARY PORTABLE AIR CLEANER
Milan S. Cornett, Walnut, Calif.
(P.O. Box 567, San Dimas, Calif. 91773)
Filed Oct. 17, 1969, Ser. No. 867,145
Int. Cl. B01d *46/04, 50/00*
U.S. Cl. 55—278 **3 Claims**



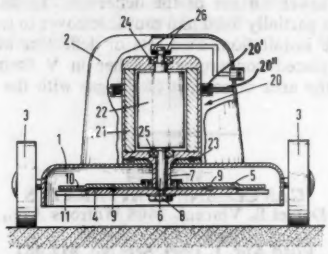
An air cleaner that embodies a closed system comprising a centrifugal dust separator with an internal spark arrester constituting a pre-cleaner, and an after filter that recirculates the air discharged from the pre-cleaner and which further cleans said recirculated air before directing said cleaned air to the inlet of the centrifugal dust separator.

3,618,303
GUIDE SEPARATOR HOUSING FOR SEPARATING AIR CHARGED WITH IMPURITIES
Ernst Nagel, Weisslingen, Switzerland, assignor to LUWA AG., Zurich, Switzerland
Filed Feb. 24, 1969, Ser. No. 801,719
Claims priority, application Switzerland, Feb. 23, 1968, 2,686/68
Int. Cl. B01d *50/00*
U.S. Cl. 55—337 **6 Claims**



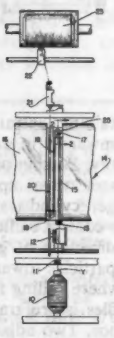
There is disclosed a guide housing for, conducting or transporting air which is charged or contaminated with impurities, such as dust or fibers. The inventive guide housing possesses a housing body member having an approximately cylindrical or spiral-shaped cross-section. This housing body member further incorporates an inlet opening, a discharge opening as well as a discharge connecting piece or stud which communicates with the discharge opening and is tangentially directed with respect to the housing body member. Furthermore, the housing body member is equipped with means for generating a spin or spiral flow within the housing body member. According to an important aspect of the inventive guide housing the discharge connecting piece or stud extends opposite to the direction of deflection of the spin-flow generating means in order to produce an aerodynamic reduction of the cross-section. Moreover, according to an important aspect of the invention, the effective flow cross-sectional area of the discharge connecting piece or stud is reduced to a fraction of the actual cross-sectional area thereof, to thereby enable discharge of air and fiber accumulations even larger than the effective flow cross-sectional area.

3,618,304
LAWN MOWER
Eckhard Hundhausen, Betzdorf (Sieg), Germany, assignor to Wolf-Gerate GmbH, Betzdorf (Sieg), Germany
Filed July 7, 1970, Ser. No. 52,957
Claims priority, application Germany, July 15, 1969, P 19 36 010.2
Int. Cl. A01d *35/26*
U.S. Cl. 56—16.9 **9 Claims**



The specification describes a lawn mower with coaxial blades counter rotating about a vertical axis and driven respectively by the stator and rotor of an electric motor. A hollow shaft emanating from the stator is fixed to one blade while also functioning to circumscribe a second shaft emanating from the rotor, which is fixed to the second blade.

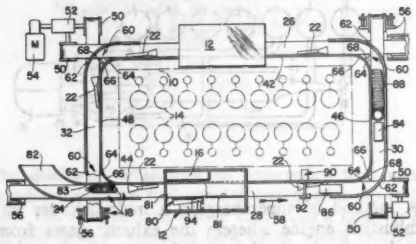
3,618,305
YARN TREATING APPARATUS AND METHOD
Richard G. Hilbert, Smithfield, R.I., assignor to Leesona Corporation, Warwick, R.I.
Continuation of appplication Ser. No. 676,751, Oct. 20, 1967. This application Aug. 1, 1969, Ser. No. 849,258
Int. Cl. D01h *13/26*
U.S. Cl. 57—34 HS **14 Claims**



A method of processing yarn and, more particularly, for producing false twisting yarn. An advancing strand of

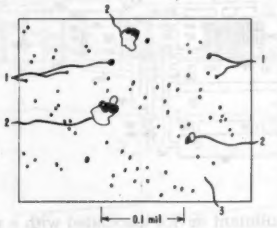
yarn is passed through a heater and substantially reverses direction across at least one cool guide before the heated yarn passes through a false twist spindle. Also disclosed is a guide pin apparatus about which the yarn is passed.

3,618,306
BOBBIN PICKUP
Earl R. Fenstermacher, North Kingstown, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Nov. 25, 1969, Ser. No. 879,857
Int. Cl. D01h *9/10*
U.S. Cl. 57—53 26 Claims



A bobbin handling apparatus for a self-tending spinning frame includes tenders which move back and forth along spinning stations and stop, as required, to service the stations. For example, the tenders doff filled bobbins, and then donn and thread-up empty bobbins. A belt conveyor encircles the spinning frame and has upper runs for carrying empty bobbins to the tenders and lower runs for receiving filled bobbins from the tenders. The empty bobbins are normally spaced from each on the conveyor. Each tender is provided with a bobbin receiver alongside the conveyor. When the receiver is operated to an active position for receiving an empty bobbin, it by-passes any bobbin (or a string of bunched bobbins) alongside, and when a bobbin is not alongside it moves to a position for receiving a bobbin from the conveyor, the bobbin causing the receiver to close and the bobbin is moved into the tender.

3,618,307
ACRYLIC FIBERS AND PROCESS FOR PREPARING THE FIBERS
Imre M. Jonkoff, Camden, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 14, 1968, Ser. No. 775,794
Int. Cl. C08f *3/76;* C10m *1/44;* D02g *3/02*
U.S. Cl. 57—140 R 14 Claims

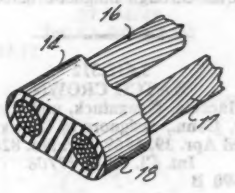


Textile fibers of synthetic acrylonitrile polymer having dispersed throughout the cross section of the fiber a salt of a partial ester of phosphoric acid with a monoalkyl ether of a polyoxyalkylene glycol; said salt being present in the amount of about 0.05% to about 3% by weight of the polymer to reduce waste in fiber processing operations and to provide a yarn of the fibers having improved quality. Also, the process for preparing the above fibers.

3,618,308
DUAL LAYER LINE ENGAGING DEVICE
Jess C. Little, Chagrin Falls, Ohio, assignor to Textron, Inc., Cleveland, Ohio
Continuation of application Ser. No. 748,502, July 29, 1968. This application Dec. 22, 1969, Ser. No. 883,678
Int. Cl. D07b *1/06;* F16l *3/00*
U.S. Cl. 57—145 28 Claims

A line gripping device having an underlying set of preformed helical wires applied over the line, and a gripping member having helically formed wires grippingly engaging this underlying set of wires. The gripping member is provided with means for engaging an anchoring device.

3,618,309
MULTI-ELEMENT RIBBON-TYPE HOIST CABLE
Ralph E. Walsh, Long Branch, N.J., assignor to Breeze Corporations, Inc., Union, N.J.
Filed Apr. 22, 1970, Ser. No. 30,805
Int. Cl. D07b *1/16, 1/22, 1/06*
U.S. Cl. 57—153 8 Claims

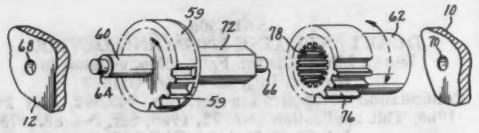


A cable assembly for winches and hoists in which two or more wire ropes are encased in an elastomer jacket in the form of an elongated ribbon. Various types of wire rope and jackets for specific requirements are disclosed.

3,618,310
CLOCK TIMER WITH SLEEP SWITCH
Charles A. Balchunas, Hopkinton, Mass., assignor to General Electric Company
Filed Apr. 15, 1970, Ser. No. 28,574
Int. Cl. G04b *11/00*
U.S. Cl. 58—21.155 6 Claims

A "sleep switch" mechanism for a clock timer wherein a unique friction clutch mechanism is positioned between a continuously rotated gear of the clock timer and a manually movable sector gear of the clock timer. The sleep friction clutch mechanism comprises two parts, a hollow pinion having internally molded flexible teeth, and a continuously rotated hexagonal shaft upon which the hollow

pinion rides so that a sliding friction clutch results from the interaction between the internal teeth of the pinion



and the hexagonal shaft when the sector gear is manually moved into engagement with the pinion gear.

3,618,311

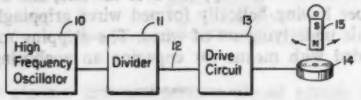
SYNCHRONIZED HOROLOGICAL SYSTEM

Leo Wiesner, Kew Gardens, and Eugene R. Keeler, Suffern, N.Y., assignors to Timex Corporation

Continuation-in-part of abandoned application Ser. No. 807,293, Mar. 14, 1969. This application Jan. 13, 1970, Ser. No. 2,586

Int. Cl. G04c *3/04;* **H02k** *33/18;* **H03k** *3/08*

U.S. Cl. 58—28 **19 Claims**



A horological instrument includes a high frequency time base, preferably a piezoelectric crystal oscillator. The frequency of the oscillator is reduced by dividing circuits. The output of the dividing circuits synchronizes an independent circuit which drives a low frequency oscillator. Preferably the system includes a single coil carried by the low frequency oscillator, which is a balance wheel and which moves through magnetic fields of alternative polarities.

3,618,312

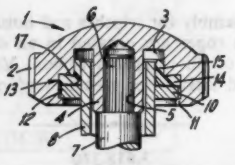
WATCH CROWN

William W. Macchia, Naugatuck, and Cyril F. Seymour, Middlebury, Conn., assignors to Timex Corporation

Filed Apr. 29, 1969, Ser. No. 820,190

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 B **3 Claims**



A watch crown for a waterproof watch includes a metal or plastic crown body having an interior cavity. A tubular pendant protruding from the bezel portion of the case of the watch is adapted to fit within the cavity of the crown body. Waterproof sealing is obtained by the use of a molded elastic gasket which is held in place in the crown by a ring which is fixed to the crown body. The gasket, in cross-section, has a flat washer-like portion and, integral thereto at the inner diameter of the washer, a raised flange-like portion having an arcuate inner face.

3,618,313

METHOD OF AND APPARATUS FOR SUPERCHARGING AN INTERNAL COMBUSTION ENGINE

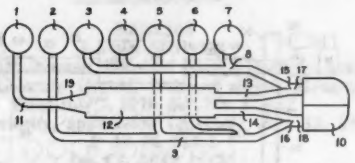
Gottlieb Zehnder, Kirchdorf, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Aug. 21, 1969, Ser. No. 851,939

Claims priority, application Switzerland, Sept. 11, 1968, 13,853/68

Int. Cl. F02b *37/00*

U.S. Cl. 60—13 **4 Claims**



A method of supercharging a multi-cylinder internal combustion engine wherein the exhaust gases from the cylinders supply the inlet to the supercharger partly in pulsed operation and partly in constant-pressure operation.

A receiver is located between one cylinder and the supercharger, the remaining cylinders are combined in at least two groups of at least two cylinders each, the exhaust gases from each group flow via an exhaust pipe to a junction with a gas outlet pipe from the receiver, and they then pass through a mixer tube to one inlet of the supercharger.

3,618,314

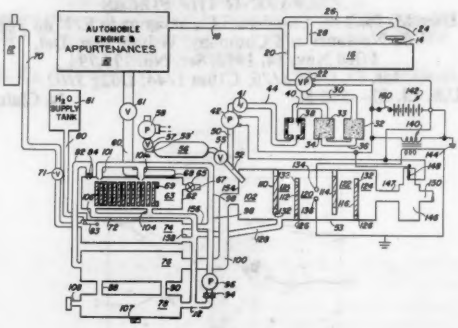
METHOD AND MEANS TO CONTROL AIR POLLUTION FROM MOTOR VEHICLES AND MOTOR VEHICLE ENGINES

LeRoy J. Krebs, 2928 N. Milwaukee Ave., Chicago, Ill. 60618

Filed Apr. 9, 1970, Ser. No. 26,856

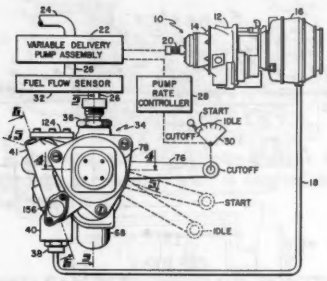
Int. Cl. F01n *3/04, 3/14*

U.S. Cl. 60—30 L **6 Claims**



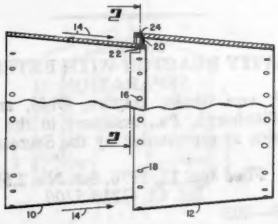
An antipollutant device associated with a motor vehicle to control the vehicle emissions to atmosphere, not only the emissions from the exhaust port of the motor but also fuel and oil evaporative emissions. The evaporative emissions are collected in a collector unit and the motor exhaust port emissions filtered and treated, and particulate matter collected and gases burned.

3,618,315
EMERGENCY FUEL FLOW CONTROL DEVICE FOR A GAS TURBINE ENGINE
Paul A. Avery, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Feb. 19, 1970, Ser. No. 12,718
Int. Cl. F02c *9/06*
U.S. Cl. 60—39.28 10 Claims



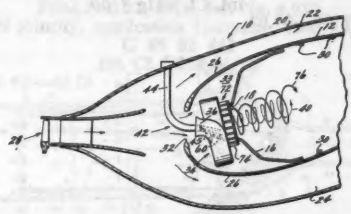
The disclosure illustrates an emergency flow control device for use in the fuel control system of a gas turbine engine. The flow control device comprises a housing having a pair of low resistance flow paths which receive the output of a variable delivery pump and provide a discharge to the gas turbine engine. A bistable solenoid operated bypass valve is positioned in the first flow path to selectively block and permit flow. A sleeve-type metering valve is positioned in the second flow path and rotated by a manually operated lever to provide a variable area orifice. A diaphragm operated throttling valve element is positioned upstream of the metering valve element. Pressure connections to the upstream and downstream side of the metering valve element are connected to the diaphragm. The throttling valve element maintains a constant pressure differential across the metering valve when the bypass valve element blocks flow through the second flow path. The bypass valve element is responsive to a condition where a controller for the variable output pump is inoperative and places the pump in a maximum delivery condition. In addition, a cutoff valve is provided in the outlet to pass flow to the engine only when a control input is provided. A manual control input from the operator lever and a solenoid input each operate to place the cutoff valve element in an open or closed position.

3,618,316
ARRANGEMENT FOR SPACING COMBUSTOR CAN SLEEVES
Charles R. Taylor, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Apr. 23, 1970, Ser. No. 31,270
Int. Cl. F23r *1/10*
U.S. Cl. 60—39.65 4 Claims



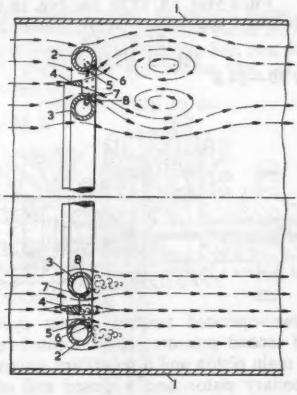
A combustion chamber liner is comprised of two telescoping combustor sections, the leading edge of the downstream section overlapping the trailing edge of the upstream section. The overlapping combustor sections are each provided with radially aligned equally spaced matching holes. Spacer pins are fitted in and secured by plug welding to the holes in the trailing edge of the upstream section. Small button-like projections on the pins snap into the matching holes in the downstream section.

3,618,317
FUEL DELIVERY APPARATUS
Thomas L. Du Bell, Cincinnati, Ohio, assignor to General Electric Company
Filed Apr. 17, 1969, Ser. No. 817,075
Int. Cl. F02c *1/00*; F02g *1/00*
U.S. Cl. 60—39.65 8 Claims



An improvement for apparatus of the type adapted to premix air and fuel or carburet air prior to introduction thereof as a vortical flow into the primary zone of a combustor; the improvement comprises a fuel collection or control surface disposed about and defining the vortical flow outlet of the apparatus together with means for generating a secondary flow of air into the combustion chamber about the collection surface to provide positive and controlled introduction of fuel to the combustor over a wide range of operating conditions.

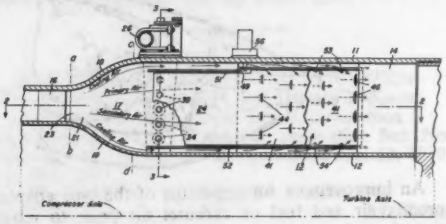
3,618,318
COMBUSTION DEVICES
William Dean Bryce, Farnham, Surrey, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed June 4, 1969, Ser. No. 830,259
Claims priority, application Great Britain, June 10, 1968, 27,394/68
Int. Cl. F02g *1/00*
U.S. Cl. 60—39.72 6 Claims



Two concentric annular tubes are mounted co-axially within an afterburner duct with an annular flow splitter disposed between them. Two circumferential rows of holes are drilled in the downstream quadrants of the tubes (relative to flow through the duct) which face each other. The application of suction to the tubes acts through the holes on the boundary layer of flow over the tubes to move the respective separation points further downstream

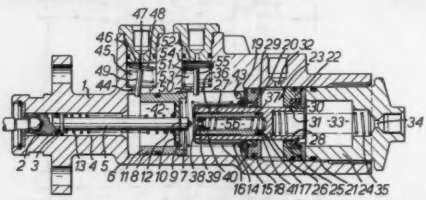
and thus deflect the flow to cause recirculation patterns. A similar effect can be obtained by blowing from suitably shaped apertures in the tubes. The tubes may alternatively be straight and arranged transversely across a duct with their respective axes parallel.

3,618,319
MAIN COMBUSTION SYSTEM AND COMBUSTION PROCESS
Paul H. Kydd, Scotia, N.Y., assignor to General Electric Company
Filed Aug. 2, 1966, Ser. No. 569,626
Int. Cl. F02g 3/00
U.S. Cl. 60—39.02 **14 Claims**



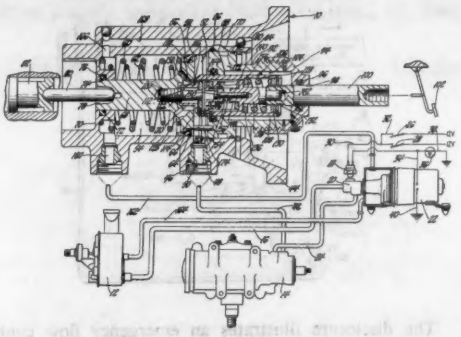
Improved construction for the combustion of fuels in a combustion system, as for example a gas turbine, is described wherein means are provided for accurately metering the incoming primary air flow in relation to changes in metered fuel inputs whereby a relatively constant equivalence ratio for the fuel-primary air mixture may be maintained, and wherein secondary air is isolated in ribbon-like radially-directed flows parallel to and interleaved with the primary air-fuel mixture for controlled cooling of the turbine nozzle partitions and/or of the combustion products. The metering means for the primary air flow automatically control the amount of air in the primary air streams in inverse relation to the amount of air in the secondary air streams.

3,618,320
HYDRAULIC BRAKING SYSTEMS FOR VEHICLES
Brian Ingram, Warwickshire, England, assignor to Girling Limited, Birmingham, England
Filed Mar. 10, 1970, Ser. No. 18,039
Claims priority, application Great Britain, Mar. 28, 1969, 16,377/69
Int. Cl. F15b 7/00
U.S. Cl. 60—54.6 **9 Claims**



A power-operated tandem master cylinder includes first and second pressure spaces located respectively between a main piston and a secondary piston, and between the secondary piston and a closed end of the cylinder bore in which the pistons work. The secondary piston comprises a telescopic assembly of which the length increases progressively as the secondary piston is advanced in the cylinder bore under the influence of pressure fluid in the first pressure space. This maintains at a substantially constant minimum, the distance between an axial extension carried by the main piston and the adjacent end of the secondary piston with which the axial extension engages upon failure of at least the first pressure space.

3,618,321
HYDRAULIC BRAKE BOOSTER ASSEMBLY
James H. Moran, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 15, 1970, Ser. No. 54,929
Int. Cl. F15b 7/00
U.S. Cl. 60—54.6 **3 Claims**

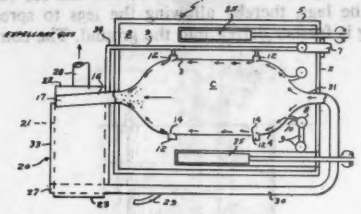


An open center type hydraulic brake booster providing three distinct brake apply effort versus master cylinder pressure relationships while applying the brakes. A valve member cooperates with a power piston forming a flow restrictor between the open center oil pressure chamber and a return passage through the piston, all within a booster housing. The valve is mounted for actuation by the push rod against the force of a biasing spring. Initial brake applying movement of the pedal push rod moves the valve to further restrict flow of pressure through the return passage developing an apply pressure upon the working face of the power piston moving the master cylinder push rod providing the first apply effort-master cylinder pressure relationship. Continued movement of the pedal push rod engages a spring biased rod pad with a protrusion on the power piston and a parallel force transference occurs, this being the second brake effort-apply pressure relation. A portion of the force on the master cylinder push rod is applied by the fluid pressure on the power piston and a portion is mechanically applied through the pedal push rod and the pad biasing spring to the piston. Upon further movement, the pedal push rod sufficiently compresses the biasing spring engaging the pad and the push rod completing a direct mechanical connection to the power piston. This establishes the third brake effort-apply pressure relationship. The rod pad is secured by an adjusting screw providing for establishing the second relationship as desired. Also the hydraulic booster housing contains a passage connecting the return side of the power piston with a rod end of the valve. The pressure and rod ends of the valve have substantially equal areas cancelling the effect of pressure pulses received in the open center pressure chamber.

3,618,322
CAVITY REACTOR WITH EXTERNAL SEPARATION
Hans J. P. von Ohain, Dayton, Ohio, and Melvin R. Keller, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Jan. 13, 1970, Ser. No. 2,599
Int. Cl. G21d 5/00
U.S. Cl. 60—203 **5 Claims**

A cavity reactor propulsion system having a cylindrical cavity formed in a moderator body with a critical quantity of fissionable material in a powdered state admitted to the cavity and with gaseous hydrogen injected through small nozzles along the wall of the cavity with no appreciable centrifugal force field within the cavity. The hy-

drogen gas plus the entrained material are drawn to a vortex type separator wherein the fissionable material is removed from the hydrogen gas and returned to the



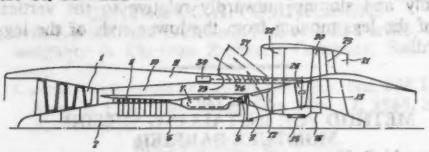
reaction cavity with the clean hydrogen gas being discharged through a conduit which is adapted to be connected to a rocket nozzle.

3,618,323

COMBINED FAN TURBINE FLOW CONTROL AND THRUST REVERSING MEANS

Peter Richard Needham, Filton, Bristol, England, assignor to Rolls-Royce Limited, Derby, England

Filed Sept. 8, 1969, Ser. No. 855,848
Claims priority, application Great Britain, Sept. 14, 1968, 43,822/68
Int. Cl. F02k *1/20, 3/02*
U.S. Cl. 60—228 6 Claims



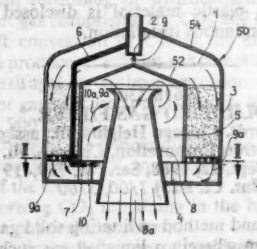
Apparatus for reversing the thrust of an aft fan engine consists of a ring of pivotable vanes which can be pivoted to close off the flow through the fan-driving turbine simultaneously with the opening of thrust reversing outlets in the engine casing upstream of the vanes. The fan will windmill in the mainstream and provide additional drag on the aircraft eliminating the need for fan-thrust reversers.

3,618,324

APPARATUS FOR DECOMPOSITION OF A FLUID MONERGOL FOR RUNNING A ROCKET MOTOR

German Munding, Bad Friedrichshall, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, near Munich, Germany

Filed Sept. 23, 1968, Ser. No. 767,906
(Filed under Rule 47(b) and 35 U.S.C. 118)
Claims priority, application Germany, Sept. 23, 1967, P 16 26 066.5
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 10 Claims



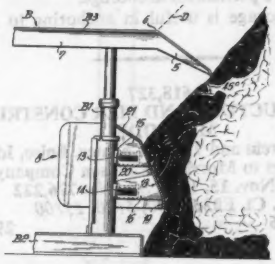
A method for the decomposing of a fluid Monergol in order to run a gas generator especially for rocket motors comprises dividing the fluid Monergol mass into a plurality of separate Monergol partial masses, separating one of the masses catalytically in an atomized state, and mixing another of the Monergol partial masses in an atomized state with the hot decomposed gases of the first Monergol partial mass so as to thermally decompose the second fluid Monergol partial mass.

3,618,325

HYDRAULIC SUPPORT SYSTEMS FOR MINE WORKINGS

Max Kuhn, Bochum-Langendreer, Gunter Bell, Hornebburg, and Willy Watermann, Dortmund-Berghofen, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Jan. 22, 1970, Ser. No. 4,930
Claims priority, application Germany, Jan. 23, 1969, G 69 02 441
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D 3 Claims



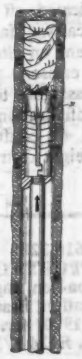
A three frame assembly for an advancing roof support, each frame having a pit prop and a roof engaging cap. A shield is common to the three frames and is secured to the two outer frames for movement with the same. The shield prevents packing material from entering between the frames and is contoured for this purpose. The center frame may advance and subsequently the two end frames together with the shield advances. The roof engaging cap for each frame inclines downwardly at an angle generally parallel to the angle of rest of the packing material.

3,618,326

RESIN ANCHORED REINFORCED BRITTLE STRUCTURES

William Herbert Montgomery, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 638,551, May 15, 1967. This application Oct. 24, 1969, Ser. No. 869,246
Int. Cl. E21d *20/00*
U.S. Cl. 61—45 B 3 Claims



Expansion shell rock bolts are more firmly anchored in rock drill holes by using an ambient-temperature-setting resin to flow around and anchor parts of the shell

to each other and to the rock while protecting from moisture loss or oxidative change. The resin is supplied in a package having at least two compartments, each containing part only of a thixotropic resin system; which is preferably over-catalyzed so that thorough mixing is not necessary. The packages have compartmental seals which are opened prior to insertion, with preferably some pre-mixing, at least some mixing occurring in the package as the package is placed in the hole in the rock, and additional mixing on discharge of the resin from the package as a bolt is placed into the hole in the rock. The package material is dead fold, and non-resilient so as to be compressed beyond the bolt. The shell is then expanded, with the thixotropic characteristics of the resin holding the resin in place around the expansion shell. The expansion of the shell gives immediate anchorage, and the later hardening of the resin gives a delayed but more permanent anchorage.

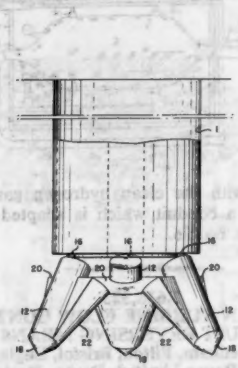
The same package is useful in anchoring to masonry and concrete.

3,618,327
CAISSON STRUCTURE AND PIER CONSTRUCTION METHODS
Joseph P. Frein and Thomas Kinter, Boise, Idaho, assignors to Morrison-Knudsen Company
Filed Nov. 15, 1968, Ser. No. 776,222
Int. Cl. E02d *5/00, 5/20, 23/00*
U.S. Cl. 61—46 **29 Claims**

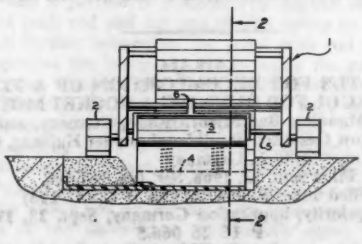
Methods for over-water construction of bridge piers, and the like, especially adapted for use at deep-water, shallow-overburden sites utilizing a unitary full-depth caisson which is prefabricated off site. Floatation and ballast chambers in the caisson facilitate movement to location, accurate placement on site, and initial sinking. A plurality of full-depth caissons are interlocked longitudinally during on-site assembly to produced a pier of desired cross-sectional configuration. Lengths of individual caissons are selected to conform to subterranean support topography. A weight distribution block is cast-anchored to the caissons.

3,618,328
BEARING SUPPORT FOR PILING
Takeo Nojima, Chiba-ken, Japan, assignor to Jupitor Corporation, Seattle, Wash.
Filed Jan. 5, 1970, Ser. No. 559
Int. Cl. E02d *5/54*
U.S. Cl. 61—53.68 **9 Claims**

A piling support for the lower end of pilings includes a plurality of tubular leg portions pivoted at their upper ends to the lower end of the piling and positioned equidistantly around the lower end of the piling, the legs having compacting means associated therewith, and means for (1) locking the legs together while the pile is being driven in the ground the desired distance and for (2) unlocking the legs, thereby allowing the legs to spread as the piling is further driven into the ground. The compacting means are half-conical sections attached to each of the legs and extending substantially the length thereof, the outer peripheral surfaces of the conical sections facing inwardly and sloping outwardly relative to the vertical axes of the legs moving from the lower ends of the legs upwardly.



3,618,329
METHOD FOR INSTALLING SUBSOIL MOISTURE BARRIER
Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Aug. 19, 1969, Ser. No. 851,397
Int. Cl. E02f *5/10;* E03b *1/00*
U.S. Cl. 61—72.6 **4 Claims**

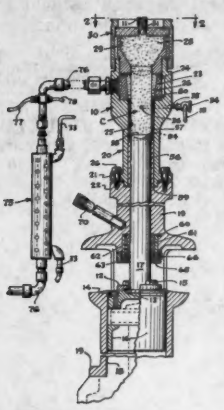


A method of installing a subsoil moisture barrier of water-impervious plastic material is disclosed with apparatus for its continuous installation.

3,618,330
SOLIDIFIED GAS FILTER
Robert C. Hardt, Chicago Heights, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Filed Sept. 12, 1968, Ser. No. 759,419
Int. Cl. F25j *1/00, 3/00*
U.S. Cl. 62—10 **6 Claims**

An apparatus and method of filtering solid gas particles from a gas stream wherein a liquefied gas such as liquid carbon dioxide is flashed into a closed chamber to form gas and a particulate snow-like material and some of the solid material is subsequently employes as a porous filter for the gas to separate the solid matter. The amount

of said material employed as a filter is regulated to provide a constant pressure drop for the gas across the filter.

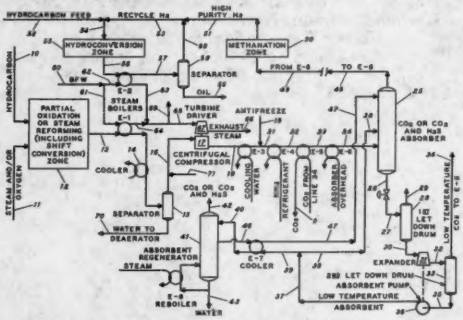


The particulate solidified gas material after being filtered is subsequently compressed into pellets.

3,618,331
HYDROGEN MANUFACTURE USING CENTRIFUGAL COMPRESSORS

Calvin S. Smith and William J. McLeod, El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 665,106, Sept. 1, 1967. This application May 17, 1968, Ser. No. 736,520
Int. Cl. F25j *3/00, 3/08*
U.S. Cl. 62—11 7 Claims



A process for manufacturing hydrogen for use in a high pressure plant employs centrifugal compressors within the following steps in one preferred embodiment:

(1) steam reforming of hydrocarbons to produce an effluent gas comprising H_2, CO_2 and CO;

(2) shift conversion of CO in the effluent from step (1) to produce an effluent gas comprising H_2 and CO_2;

(3) centrifugal or turbocompression of the step (2) effluent gas mixture comprising H_2 and CO_2 to above about 900 p.s.i.g.;

(4) lowering of the temperature of the CO_2–H_2 mixture to below about 0° F. to condense and separate a portion of the CO_2;

(5) absorbing CO_2 remaining in the hydrogen-rich gas using a physical absorbent;

(6) catalytic methanation of residual CO_2 and CO in the effluent from the absorption step (5) to obtain purified hydrogen;

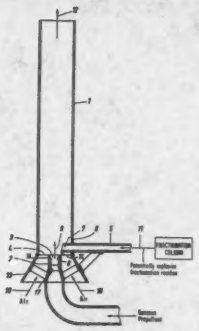
(7) use of the purified hydrogen in a hydroconversion process; and

(8) recovery of heat from the hydroconversion process to generate steam which is used as a driving medium for the centrifugal compression of step (3).

3,618,332
EVAPORATION OF POTENTIALLY EXPLOSIVE RESIDUE OF OXYGEN CONTAINING GAS FRACTIONATION PROCESS

Lothar Setzpfandt, Munich, and Josef Stockner, Baierbrunn, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 16, 1968, Ser. No. 745,218
Claims priority, application Germany, July 19, 1967, L 57,024
Int. Cl. F25j *3/08*
U.S. Cl. 62—18 5 Claims

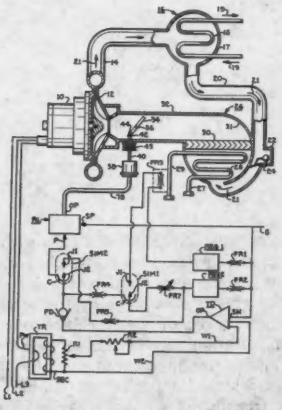


Low-boiling point liquids are evaporated in an evaporating stream formed by entraining ambient air in a jet of propellant gas. The liquid to be evaporated is atomized by injection into the jet and an aerosol is thereby formed. The atomized liquid is continuously evaporated in the thus formed aerosol stream by heat derived from the change of enthalpy of the ambient air and propellant gas.

3,618,333
FLUIDIC CONTROLS FOR REFRIGERATION APPARATUS

Niels E. Pedersen, Milwaukee, and Otto R. Munch, West Allis, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

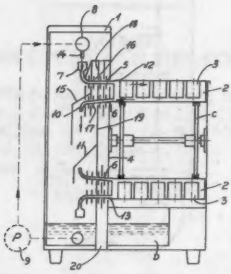
Filed Apr. 2, 1970, Ser. No. 25,072
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 9 Claims



A temperature responsive fluidic resistor monitors the temperature of chilled water flowing to a load from an

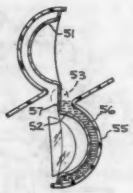
evaporator of an electric motor driven refrigeration apparatus. The fluidic resistor in response to temperature change controls the output of a fluidic amplifier, which output is interconnected to a pneumatic relay. The relay controls a fluid motor which positions throttling mechanism to regulate the flow of refrigerant gas from the evaporator to the compressor to maintain a desired temperature of chilled water to the load.

3,618,334
CONTACT FREEZING APPARATUS
Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark
Filed Feb. 26, 1970, Ser. No. 14,588
Claims priority, application Denmark, Feb. 27, 1969, 1,097/69
Int. Cl. F25c *1/10*
U.S. Cl. 62—345 **8 Claims**



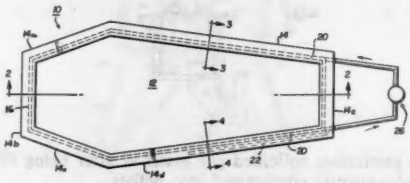
In a contact freezing apparatus elongated freezing elements are arranged side by side in the form of an endless band and are provided with inlet and outlet means extending through a slot of the same general shape as the endless band into a cabinet, in which means are provided for circulating a freezing medium through each freezing element via said inlet and outlet means.

3,618,335
AUTOMATIC ICEMAKER
Daniel N. Toma, Louisville, Ky., assignor to General Electric Company
Filed Sept. 17, 1969, Ser. No. 858,712
Int. Cl. F25c *1/10*
U.S. Cl. 62—349 **2 Claims**



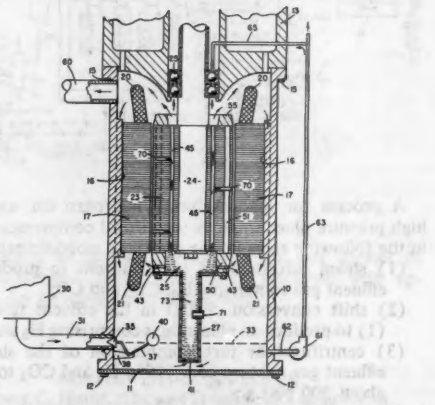
An automatic icemaker of the type including a rotatable mold containing cavities in which a measured charge of water is frozen and from which ice pieces are heat released for gravity discharge by the warming action of a subsequent charge of water. The mold is so designed that during rotation thereof the subsequent water charge is first confined in direct contact with all of the mold walls from which ice pieces are to be released and is thereafter transferred to mold cavities for the freezing thereof. In one embodiment of the invention, the subsequent charge is transferred to the same mold cavities from which ice pieces have been released by its warming action. In another embodiment, the mold comprises two sets of cavities and the water used to heat release ice pieces from one set is thereafter transferred to the other set of cavities.

3,618,336
COOLED COFFIN STRUCTURE
James R. Palma, 1502 Curry Road, Schenectady, N.Y. 12306
Filed May 21, 1970, Ser. No. 39,267
Int. Cl. F25d *23/06*
U.S. Cl. 62—451 **2 Claims**



A coffin is provided having a hollow side wall and opening along said side wall inside of said coffin connected to an air circulating unit adapted to introduce air into the hollow side wall and continuously recirculate the air over and around a corpse disposed in the coffin by means of the hollow side wall and the spaced openings to dissipate odor and to slow decomposition of the corpse inside the coffin.

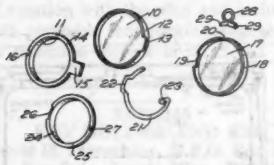
3,618,337
HERMETIC REFRIGERATION COMPRESSOR
Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 22, 1970, Ser. No. 48,360
Int. Cl. F25b *31/00*
U.S. Cl. 62—505 **5 Claims**



The lower end of the casing of the vertically mounted hermetic compressor unit is formed with an oil sump to which liquid refrigerant is supplied. The liquid oil-refrigerant mixture is elevated from the sump by a lift tube fixed to and depending from the motor rotor. During operation of the motor, a rotational vortex is formed in the tube and the liquid mixture is passed upwardly through axially extending passages in the rotor and is dispensed on the upper

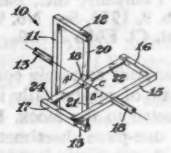
and lower end turns of the stator windings. Suction is applied to the casing above the motor for removal of refrigerant vapor.

3,618,338
LOCKET HAVING WIRE ELEMENT FURNISHING A HINGE AND CATCH MEMBER
Alfred Eugene Sauer, Warwick, R.I. assignor to B. A. Ballou & Co., Incorporated, East Providence, R.I.
Filed Oct. 19, 1970, Ser. No. 81,641
Int. Cl. A44c *15/00*
U.S. Cl. 63—19 3 Claims



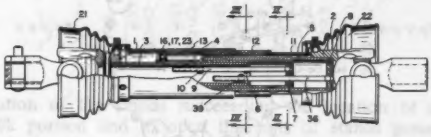
A locket having a novel hinge construction. The locket comprises a front case having a peripheral flange formed with a notch, a front case field piece fitted therein, having a tongue received in the notch and a female catch opening, a back case having a peripheral flange formed with a notch through which the tongue also extends, a recess that constitutes a ring anchorage, a hinge wire formed as a segment of a circle greater than 180° fitted in the back case, with an offset portion thereof located where the notches meet, an outturned end portion constituting a male catch, and a back case field piece press fitted in the back case to secure the hinge wire. The back piece has a notch in alignment with the notch in the back case and a slot which accommodates the male catch. When the front and back cases, with the field pieces therein, are assembled, the tongue is bent over the offset portion of the hinge wire. A ring having opposed shoulders is anchored to the back case by positioning the shoulders between the peripheral flange of the back case and the back case field piece, projecting through the recess in the peripheral flange. In a modification the ring is formed as an integral part of the hinge wire.

3,618,339
UNIVERSAL JOINT
Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jan. 30, 1970, Ser. No. 7,129
Int. Cl. F16d *3/62*
U.S. Cl. 64—12 5 Claims



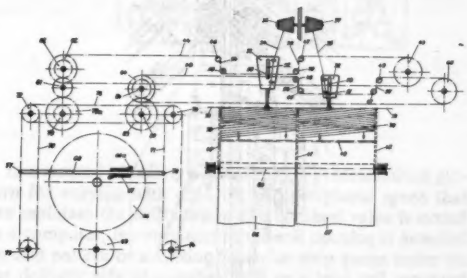
A universal joint is prepared without bearings and having flexing members at right angles to each other whose major cross-sectional dimension is parallel to the axis of rotation of the shafts.

3,618,340
TELESCOPING UNIVERSAL JOINT SHAFT
Hubert Geisthoff, Donrath, and Heinrich Welschof, Geber, Germany, assignors to Jean Walterscheid KG, Lohmar, Germany
Filed July 29, 1970, Ser. No. 59,308
Claims priority, application Germany, Aug. 28, 1969, P 19 43 837.0
Int. Cl. F16d *3/06*
U.S. Cl. 64—23 5 Claims



A shaft for transmitting torque between two universal joints comprises three telescoping tubular shaft members axially moveable with respect to each other and enclosed by three telescoping protective tubular members also axially moveable. Stop means are provided on the inner and outer tubular shaft members engageable with portions of the intermediate tubular shaft member for limiting its axial movement. The intermediate protective tube member is journaled on the intermediate shaft member with both intermediate members being moveable together.

3,618,341
WARP KNITTING MACHINE
Engelbert Ehrlich, Floha, Saxony, and Bertram Frenzel, Wolfgang Neubert, Friedrich Schattauer, and Wolfgang Wunsch, Karl-Marx-Stadt, Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany
Filed Apr. 13, 1970, Ser. No. 27,889
Int. Cl. D04b *23/12*
U.S. Cl. 66—84 7 Claims

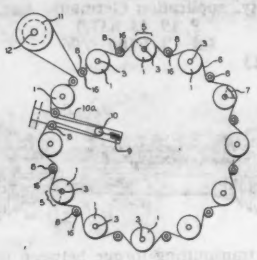


In a warp knitting machine in which a preformed weft is fed to a knitting zone in which warp yarns are knit thereinto, the improvement comprising means for feeding at least two preformed wefts side by side through the knitting zone and thereby forming a corresponding two longitudinal strips of fabric.

3,618,342
DEVICE FOR THE FEED OF ELASTOMER THREADS, PARTICULARLY IN CIRCULAR KNITTING MACHINES
Günter Wurm, Wuppertal-Sudberg, Germany, assignor to Glanzstoff AG, Wuppertal, Germany
Filed May 21, 1969, Ser. No. 826,324
Claims priority, application Germany, May 28, 1968, P 17 60 504.8
Int. Cl. D04b *15/50*
U.S. Cl. 66—132 T 4 Claims

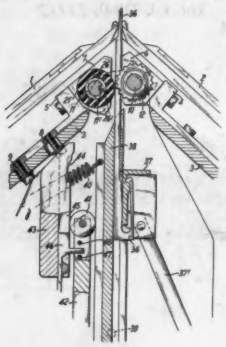
Device adapted for feed of elastomer threads from a plurality of rotatable bobbins, especially adapted for

circular knitting machines, characterized by a common belt or band bobbin-drive means and braking means, which are constructed and coupled in such a way that in



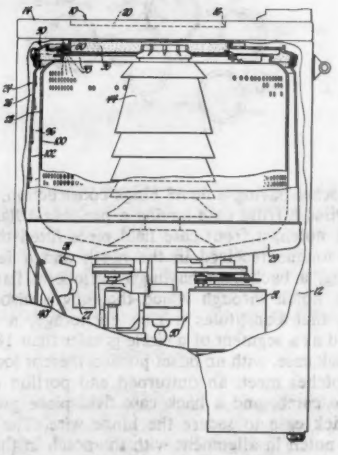
rotation of the bobbins they yield equal circumferential velocities of the elastomer thread windings on respective bobbins.

3,618,343
FABRIC DRAW-DOWN MECHANISM FOR FLAT KNITTING MACHINES
Karl Essig, Reutlingen, Germany, assignor to H. Stoll & Company, Reutlingen, Germany
Filed Dec. 5, 1969, Ser. No. 882,686
Claims priority, application Germany, Dec. 6, 1968, P 18 13 052.4
Int. Cl. D04b *15/88*
U.S. Cl. 66—149 **16 Claims**



In a flat knitting machine for the production of shaped knitted goods having three-dimensional portions, a fabric drawdown mechanism is arranged directly beneath the needle beds. The mechanism includes a draw-down roller composed of peripherally toothed roller components of relatively small axial dimensions mounted on a first rotatable shaft and spaced apart by annular recesses through which draw-down hooks can pass, the roller components being driven by the first shaft through an adjustable yieldable drive whereby they can slip circumferentially about the first shaft when a predetermined loading is exceeded. Cooperating with the draw-down roller is a composite counter pressure roller composed of individual rollers of reduced axial dimension, these rollers adjustably bearing against driving discs which are secured on a second rotary shaft and disposed between the rollers, whereby the rollers rotate together with the second shaft so long as the resistance does not exceed a predetermined maximum value. The draw-down hooks during their passage through the annular recesses between the roller components are deflected to bear against the counter pressure rollers so as to prevent the new knitting looped in the hooks from being disengaged therefrom by the rotating roller components.

3,618,344
CLOTHES WASHER HAVING A DIVERGING WATER CONTAINER FOR SUDS CONTROL
Robert E. Hoffman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed July 17, 1970, Ser. No. 55,814
Int. Cl. D06f *29/00, 39/08*
U.S. Cl. 68—23.5 **4 Claims**

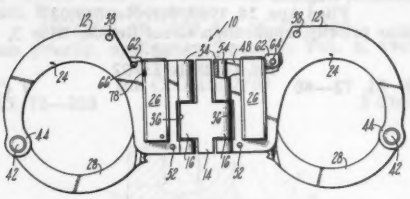


A domestic clothes washer has a pair of nested and spaced tubs one of which (water container) is imperforate to retain the washing fluid, the other of which (spin basket) is perforated and rotatable to centrifuge the washing fluid from clothes being washed therein. A preipheral fill system includes a fill tube circumscribing the top of the nested pair of tubs. The fill tube has slots to provide a circumferential series of sprays, a portion of which enters the space between the tubs for flushing suds therefrom prior to rinsing. The sidewall of the water container diverges downwardly from the cylindrical sidewall of the spin basket as an aid in flushing suds from the space between the tubs.

3,618,345
DOUBLE-HINGE HANDCUFF ASSEMBLY
Hollis B. Smith, Island Pond, Vt., assignor to Essex Lock & Manufacturing Company, Inc., Island Pond, Vt.
Filed Feb. 9, 1970, Ser. No. 9,521
Int. Cl. E05b *25/00*
U.S. Cl. 70—16 **8 Claims**

A double-hinge handcuff assembly comprises a central hinge block and a pair of substantially identical lockable cuffs pivotally connected to the block. Each cuff is constructed of a folded one-piece sheet metal body member of generally U-shaped, cross-sectional configuration having a pair of spaced confronting side walls and an integral arcuate connecting portion forming a hinge knuckle for connecting the cuff to the hinge block. Each cuff is further provided with a curved shackle movable between open and closed positions and pivotally connected to the side walls for movement therebetween. A lock assembly

securely mounted on the confronting wall portions adjacent the hinge connection includes a rotatable key-operated tumbler plug and a shackle lock drum connected



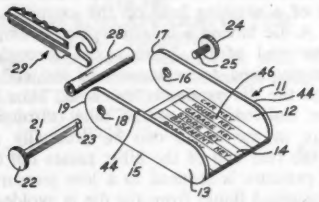
thereto by a lost-motion connection. The drum is adapted for coaxial rotation with the plug and includes peripheral locking teeth rotatable into locking engagement with the shackle for retention thereof in its closed position.

3,618,346

KEY HOLDER AND KEY

David H. Humphrey, G.P.O. Box 2226, San Juan, Puerto Rico 00936

Filed July 22, 1970, Ser. No. 57,223
Int. Cl. A47g *29/10; E05b 19/04*
U.S. Cl. 70—408 9 Claims



An improved key holder and a novel key designed for use with the improved key holder. The novel key includes a conventional shank portion and a head portion having opening means including a hole and a groove therein, with the groove extending from the hole to the outer margin of the head portion and with the width of the narrowest part of the groove being less than the diameter of the hole. The improved key holder includes a resilient tube which extends through the hole in the key when the key is held in the key holder. A bar extends through the tube and normally prevents keys from being added to or removed from the tube because the combined maximum dimension of the bar and tube, even when the tube is radially compressed, is greater than the width of the narrowest part of the groove. However, when it is desired to add or remove a key from the key holder, the bar is withdrawn from the tube to permit the tube to be radially compressed to an extent that the key may be pulled or passed over the tube.

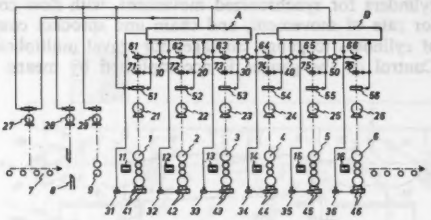
3,618,347

METHOD OF OPERATING A HOT STRIP-FINISHING TRAIN WHEN A LEADING END OF STRIP TO BE ROLLED HAS BEEN STUCK

Johann Krausz, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Mar. 2, 1970, Ser. No. 15,338
Claims priority, application Austria, Apr. 1, 1969, A 3,182/69
Int. Cl. B21b *37/00*
U.S. Cl. 72—5 11 Claims

An automatic control system to prevent damage when a leading end of a strip has been stuck in a hot rolling mill train. The system operates to sever the strip before the first stand or between the first and second stands, to reverse the roller bed and scale breaker, to maintain



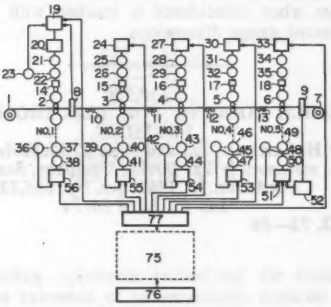
rotation of the stands succeeeding the location of the stuck portion and to open the rolls of stands preceding the location of the stuck portion.

3,618,348

METHOD OF CONTROLLING ROLLING OF METAL STRIPS

Tohru Arimura, Masamoto Kamata, and Morio Saito, Kawasaki-shi, Kanagawa-ken, and Terumi Okamoto, Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Fukuyama-shi, Hiroshima-ken, Japan

Filed May 16, 1969, Ser. No. 825,354
Claims priority, application Japan, May 21, 1968, 43/33,741
Int. Cl. B21b *37/02, 37/06, 37/08*
U.S. Cl. 72—7 14 Claims



In a method of rolling a metal strip, a predetermined pattern for varying with time the roll peripheral speed that can maintain the strip tension at a constant value is stored in a computer, the variation in the roll opening is detected by said pattern or a tension meter or strip gauge meter on the delivery side of a rolling mill or a load cell mounted on the rolling mill or combinations thereof, and the preliminary control of the variation with time of the roll peripheral speed is effected by the detected variation in the roll opening so as to compensate for the variation in the strip gauge. In rolling a metal strip composed of a number of welded metal bands of different gauges, said pattern is predetermined with regard to the variation of the strip gauge at the welds, so as to maintain the strip tension always a constant value.

3,618,349

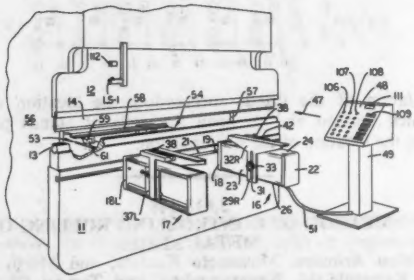
GAUGING SYSTEM FOR PRESSES

Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc., Indianapolis, Ind.

Filed Mar. 26, 1969, Ser. No. 810,697
Int. Cl. B21b *37/12*
U.S. Cl. 72—8 18 Claims

Two gauge assemblies mounted in front of the forming tools of a press brake, and two assemblies in back of the forming tools, incorporate pneumatic cylinders to drive

gauge carriages facilitating automatic programmed control and positioning of gauges. The front gauge cylinders are hydraulically slave to each other, as are the rear gauge cylinders for synchronized movement, with flow control for rate of movement, and chain and sprocket coupling of cylinders to gauge carriages for travel multiplication. Control of the gauges is accomplished by means of a



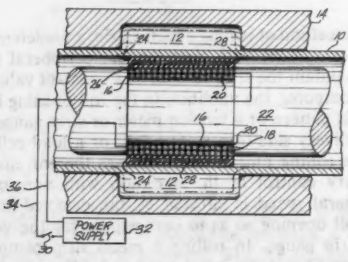
rotary encoder mounted on one gauge housing of both the front and rear units which is constantly measuring the position of the gauge in use thru electrical impulses generated in direct proportion to the gauge travel and sent to a digital electronic controller that employs counting circuits to shut off solenoid valves in the gauge assemblies when coincidence is reached with the desired pre-selected gauge dimensions.

3,618,350

REUSABLE TOOLING FOR ELECTROMAGNETIC FORMING

Walter H. Larrimer, Jr., and John E. McFarland, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 15, 1969, Ser. No. 885,228
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 10 Claims



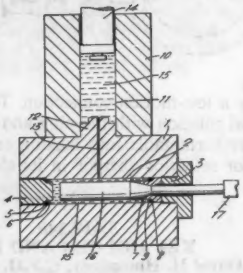
An electrically conductive and deformable metallic structure of wire braid, wire mesh, metallic fabric, or the like bonded to or imbedded within an elastomeric material. When subjected to an intense varying magnetic field, the metallic structure forceably deforms and the elastomeric material transmits the deforming force to a workpiece forming it into an adjacent die. Upon removal of the magnetic field, the elastomeric material restores the metallic structure to its original configuration. An electrical power supply and an electromagnetic coil selectively generates a magnetic field and restraining members or a mandrel prevents destructive deformation of the magnetic coil.

3,618,351

HYDROSTATIC EXTRUSION

Peter John Thompson, St. Anne's-on-Sea, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 24, 1969, Ser. No. 819,027
Claims priority, application Great Britain, May 3, 1968, 21,188/68
Int. Cl. B21c *23/02*
U.S. Cl. 72—60 7 Claims



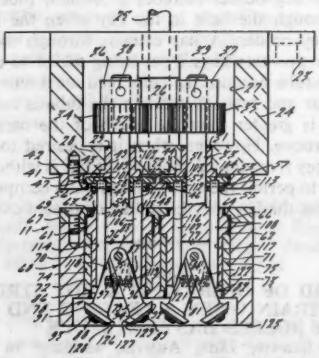
The disclosure relates to a process for extruding a billet through a die by subjecting the billet to the pressure of hydraulic liquid in a container and by application of a direct mechanical loading on the billet such as by application of a drawing load on the extruded length of the billet. A die having a conical orifice is employed and as the rear end of the billet passes through the die the stresses required for extrusion of the end of the billet through the die gradually decrease. Thus during extrusion of the rear end of the billet through the die the pressure in the liquid can be gradually reduced until when the rear end of the billet passes out of the die the liquid pressure is reduced to a low pressure and a blast of pressurised liquid from the die is avoided.

3,618,352

CUTOFF TOOL AND METHOD

George Mink, 13130 Geoffrey, Warren, Mich. 48026

Filed May 19, 1969, Ser. No. 825,605
Int. Cl. B21d *3/02, 31/02*
U.S. Cl. 72—71 8 Claims

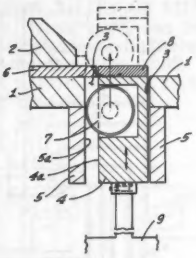


An apparatus and method for cutting off and upsetting projections of one member for fixing such member to another member. The apparatus includes pairs of cutting heads that are rotatably supported and which are additionally pivotal for movement into engagement with the projections to be cut for cutting and upsetting such projections.

3,618,353
METHOD FOR WELDING TWO SHEET METAL EDGES

Werner Meyer, Hannover, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Feb. 10, 1969, Ser. No. 798,085
Claims priority, application Germany, Feb. 8, 1968, P 16 52 819.1
Int. Cl. B21d 7/02
U.S. Cl. 72—220 3 Claims

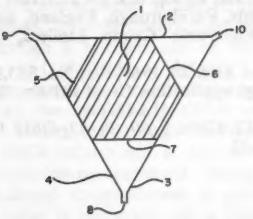


For edge-to-edge welding of two metal sheets, one of them is bent up (folded) along the edge by a roller.

3,618,354
METHODS AND APPARATUS FOR METAL ROLLING

Ali Bindernagel, Dusseldorf-Gerresheim, and Werner Demny, Dusseldorf-Oberkassel, Germany, assignors to Friedrich Kocks, Dusseldorf, Germany

Filed May 6, 1970, Ser. No. 34,982
Int. Cl. B21b 13/10, 13/12
U.S. Cl. 72—224 4 Claims



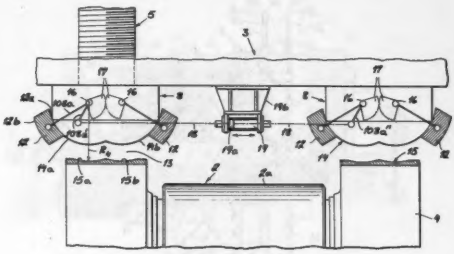
A wire or rod reduction mill having three-roll stands wherein first the workpiece is reduced to an equilateral triangular shape, then a non-equilateral hexagonal shape and finally rolled on rolls having curved non-circular grooves.

3,618,355
ROLLING MILL AND SYSTEMS FOR FACILITATING THE INTERCHANGE OF ROLLING-MILL ROLLS

Walter Brahm, im Mulheim (Ruhr), and Peter Zens and Theodor Josef Sevenich, Dortmund, Germany, assignors to Maschinen- und Werkzeugbau GmbH, Dortmund-Hombruch, Germany

Filed July 18, 1969, Ser. No. 843,129
Claims priority, application Germany, July 19, 1968, P 17 52 817.5; Mar. 19, 1969, P 19 13 771.4
Int. Cl. B21b 31/08
U.S. Cl. 72—238 21 Claims

A rolling-mill system in which at least two rolling-mill rolls are provided, between the threaded gap-adjusting spindle and the bearing blocks of the rolls, with a thrust-bearing structure and a spacer block swingable or shiftable from between the thrust bearing and the journal bearings of the rolls to free the latter for replacement. The roll-changing arrangement comprises a carriage supporting a pair of rolls adjacent the rolling-mill stand and shiftable in the rolling direction into alignment axially

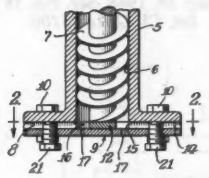


with the roll-accommodating openings of the stand, and an insertion carriage engageable with one end of the rolls for supporting same and feeding the rolls axially into the stand.

3,618,356
EXTRUDING APPARATUS

Joseph R. Sagmuller and John F. Joyce, Columbus, Ohio, assignors to National Standard Company, Niles, Mich.

Filed Sept. 5, 1969, Ser. No. 855,587
Int. Cl. B21c 23/00; D01d
U.S. Cl. 72—262 7 Claims



An extruding apparatus embodying die means for effecting the extrusion of an extrudable material into a plurality of elongated articles at a uniform rate.

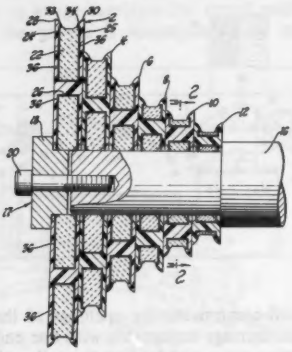
3,618,357
COMPOSITE CAPSTAN ASSEMBLY

Duane H. Beninga, Arvada, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Filed Apr. 30, 1970, Ser. No. 33,235
Int. Cl. B21c 1/02
U.S. Cl. 72—289 7 Claims

A capstan comprising a ceramic ring having a plurality of openings therethrough and having bonded to each of the side walls thereof a ring of another material having greater crack resistance than that of the ceramic ring and having a greater outside diameter than that of the ceramic ring such that the rings of other material provide radially outwardly extending annular flanges on each side of the ceramic ring, at least the inner surface of each of the rings of other material being an organic resin which extends through said openings thereby providing a unitary organic resin body which is mechanically interlocked with the ceramic ring. In the preferred embodiment the rings of other material are formed entirely of organic resin and the ceramic ring has a thin layer of metal thereon to increase the bond strength between the ceramic ring and the resin. An assembly of such composite capstans of decreasing diameter provides a stepped-cone draw block for wire drawing which has

optimum wear resistance along with optimum resistance to breakage and yet which can be manufactured simply and at a low cost. In the event there is breakage of the



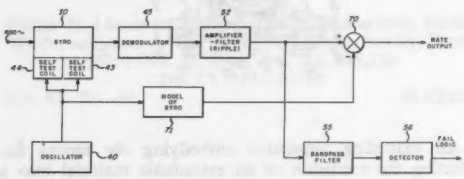
ceramic ring, the mechanical interlock with the resin body inhibits disintegration of the ceramic ring from centrifugal force even at high rotary speeds.

3,618,358

CONTINUOUS SELF-TEST INERTIAL APPARATUS

John C. Dendy, Phoenix, and Carl D. Griffith and Everett R. Tribken, Scottsdale, Ariz., assignors to Sperry Rand Corporation

Filed Dec. 30, 1968, Ser. No. 787,890
Int. Cl. G01c *25/00*
U.S. Cl. 73—1 **9 Claims**



Continuous self-test apparatus for inertial devices having a sensitive element wherein the sensitive element is continuously exercised to provide a composite signal representative of the effects of exercising the sensitive element and the normal operation of the device in which the output signal is representative of the normal operation of the device.

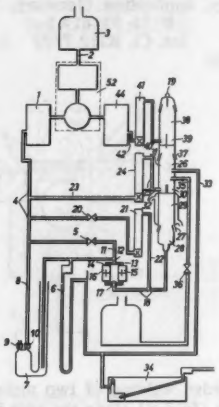
3,618,359

OLFACTOMETER

Rudolf Randebrock, 32 Dusterntwiete, 2 Garstedt, Bezirk, Hamburg, Germany, and Otto Neese, Hamburg, Germany; said Neese assignor to said Randebrock

Filed Aug. 1, 1969, Ser. No. 846,700
Claims priority, application Germany, Aug. 6, 1968, P 17 98 003.9
Int. Cl. G01n *31/00*
U.S. Cl. 73—23 **6 Claims**

The olfactometer includes a perfume source for holding a perfume sample and one or more rarefying devices, with connections thereto from a metered air supply for rarefying the perfume with air, connected to the outlet side of the perfume source. The perfume is diluted until the perfume impression thereof can then be determined in dependence of the concentration and the threshold value. The perfume source and the or each rarefying device are interconnected by capillary tubes to form a single combination and this combination is so connected to the olfactometer casing that all or the various sections there-



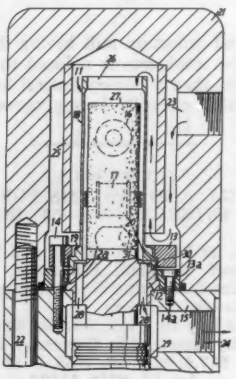
of can be removed with ease and replaced by uncontaminated sections so that a new perfume can be tested in the knowledge that there will be no residual perfumes to contaminate it.

3,618,360

TRANSDUCERS SUITABLE FOR USE IN MEASURING THE DENSITY OF OR THE PRESSURE OR A PRESSURE DIFFERENCE IN FLUIDS

Ian F. M. Curtis, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 28, 1969, Ser. No. 853,915
Claims priority, application Great Britain, Aug. 30, 1968, 41,645/68
Int. Cl. G01n *9/00, 29/02*; G01f *1/00*
U.S. Cl. 73—32 **35 Claims**



A transducer for measuring fluid density or pressure or pressure difference has a hollow cylindrical body with integral circuit flanges at one end. The flanges overlap axially of the body to provide an elastically flexible connection

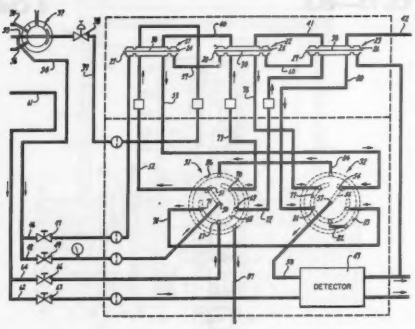
therebetween. In use, the body is set into vibration while in contact with fluid so that the frequency of the vibration is affected by the density or pressure or pressure difference in the fluid. One of the flanges establishes a node at the corresponding end of the hollow body, and the other flange enables the hollow body to be mounted on a supporting structure without interfering with the node-forming flange.

3,618,361

METHOD AND APPARATUS FOR DETERMINING GAS PERMEABILITY OF FILM

Thomas M. Stephens, Menlo Park, and James A. McNulty, Belmont, Calif., assignors to Dohrmann Instruments Company, Mountain View, Calif.

Filed Mar. 2, 1970, Ser. No. 15,324
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 **9 Claims**



A method and apparatus for determining the permability of membranes using a multiplicity of permeable cells. The upstream compartments are connected in series and are supplied with a continuous stream of permeable gas. Two valve means are operatively associated to direct carrier gas through a selected one of the downstream compartments and through a detector and simultaneously, a purge gas is directed through the non-selected cells by shifting the operative positions of the valves, purge gas may be directed through the formerly selected compartment while carrier gas is directed through the formerly non-selected compartment. Means for bypassing the downstream compartments is provided in the valves. Each valve is preferably of a rotary type and includes sealing means formed of an annular groove around the valve switching ports with a continuous stream of carrier gas flowing therein. In a preferred embodiment of the cell assemblies, the membrane is retained and sealed between the upstream and downstream compartments using springs which urge the mating wall of one of said compartments toward the other compartment mounted on a spring floated base.

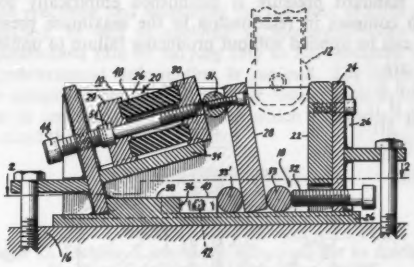
3,618,362

PROGRAMMING MEANS FOR SHOCK TESTING MACHINES

Gilbert F. Hill, Skaneateles, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 2, 1970, Ser. No. 17
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **16 Claims**

A shock programmer for use with shock testing apparatus wherein a striker member which may be on the underside of a movable specimen-supporting carriage, is adapted to be decelerated in a desired manner by engagement with a force resisting channel which channel has an elastomeric spring means, or other suitable energy absorbing means, arranged so that the energy of the impacting striker member is imparted simultaneously to the channel and the elastomeric spring means. The reaction force can be adjusted, as required to obtain a desired shock pulse, by adjustment of the shape of the tapered



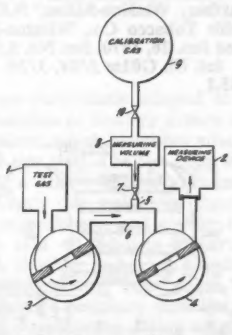
impact channel and selection and/or adjustment of the characteristics exhibited by the energy absorbing-storing means.

3,618,363

CALIBRATION ARRANGEMENT FOR AN APPARATUS FOR MEASURING THE GAS CONTENT OF MATERIAL

Thaddaus Kraus, Vaduz, Liechtenstein, assignor to Balzers Patent- und Beteiligungs-Aktiengesellschaft, Balzers, Liechtenstein

Filed Apr. 6, 1970, Ser. No. 25,937
Claims priority, application Switzerland, Apr. 8, 1969, 5,397/69
Int. Cl. G01n *7/14*
U.S. Cl. 73—1 A **4 Claims**



An arrangement for the quantitative analysis of gases which are liberated from the gas source includes a pump system connected to the source, to collect the gas to be analyzed, a gas collecting space connected to the pump system discharge, and a device for inserting measured amounts of calibration gas, from a source thereof, into the gas collecting space. The pump system comprises a two-stage or multi-stage pump system, with the stages being interconnected by connection lines. The calibrating gas insertion device is connected into the connecting line between two successive pump stages.

3,618,364

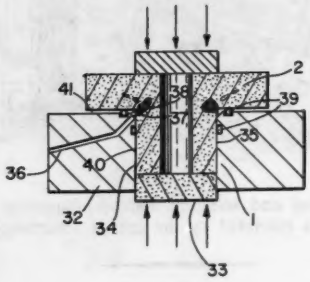
METHOD AND APPARATUS FOR TESTING POWDERED COMPACTS

Ivor Hawkes, Lyme, N.H., assignor to Creare Inc., Hanover, N.H.

Filed Sept. 2, 1969, Ser. No. 854,589
Int. Cl. G01m *3/26*
U.S. Cl. 73—37 **9 Claims**

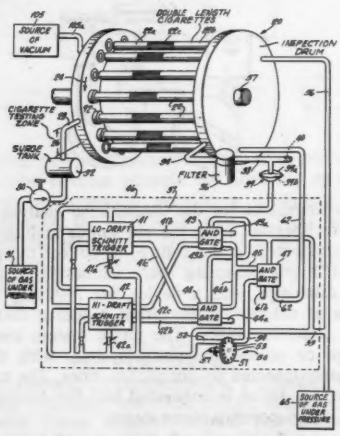
A method and apparatus for testing unsintered compacted powder articles for structural flaws by passing a fluid under pressure into regions of the article where

flaws are most likely to occur. The fluid can be applied under a constant standard pressure or a variable pressure which is increased up to the standard pressure such that flawed articles fail and unflawed articles remain intact. The standard pressure is established empirically for a given compact in relationship to the maximum pressure that can be applied without producing failure to unflawed



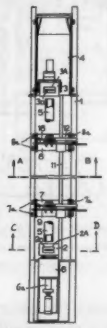
compacts made from the same composition and by the same method. The compact during test is clamped in a jig adapted so that fluid pressure can be applied to predetermined regions where flaws are suspected and so designed that the compressive clamping force is not applied in opposition to the tensile force on the flaw region generated by the fluid.

3,618,365
CIGARETTE AND FILTER INSPECTION SYSTEM
Colin S. McArthur, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.
Filed Jan. 26, 1970, Ser. No. 5,592
Int. Cl. G01m *3/04, 3/26*
U.S. Cl. 73—45.1 **15 Claims**



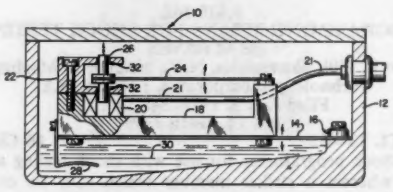
Cigarette and filter inspection apparatus comprising means for applying a test pressure individually to cigarettes or filters in a high-speed manufacturing line and fluidic means for sensing the level of the pressure flow in each and supplying a reject signal when the flow level is above or below an acceptable range. The fluidic means comprises both a high and a low level pressure-sensing Schmitt trigger and two and-gates, each of which receives one output from each Schmitt trigger and has one of its outputs mutually feeding a third and-gate whose other input is a synchronized pulse timed with the application of a test pressure pulse. Thus, when the level of the pressure flow in a given cigarette or filter is outside an acceptable range, the output of the appropriate Schmitt trigger will shift, shifting the output of the corresponding and-gate and when coincident with a synch pulse, shifting the output of the third and-gate to actuate a memory or reject means. The system automatically resets itself after each testing.

3,618,366
APPARATUS FOR TESTING OF PIPES OR THE LIKE
Kurt Pauls, Langenfeld, and Hans Brauer, Leichlingen, Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany
Filed Jan. 15, 1970, Ser. No. 3,034
Int. Cl. G01n *3/12*
U.S. Cl. 73—49.5 **8 Claims**



A testing apparatus for pipes wherein the testing heads which engage the end portions of a pipe during testing with a fluid are insertable into the chambers of aligned stationary or indexible supports and are provided with sealing rings which engage the circumferences or the end faces of pipes during testing. The positions of sealing rings and fluid conveying passages in the testing heads are selected in such a way that the parts which support and clamp intermediate portions of pipes during testing require minor adjustments when a larger-diameter pipe is tested after a smaller-diameter pipe or vice versa.

3,618,367
VIBRATION PICK-UP DEVICE
Marcellus S. Merrill, 335 Colorado Blvd., Denver, Colo. 80206
Filed Jan. 22, 1970, Ser. No. 4,804
Int. Cl. G01n *24/00*
U.S. Cl. 73—71.4 **10 Claims**



Apparatus for balancing rotatable bodies, such as automotive vehicle wheels, characterized by an electromagnetic pick-up device including a pair of cantilevered springs providing a double spring suspension, one being

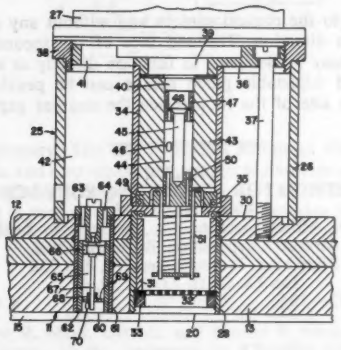
supported by the other, and including suitable damping means, the construction being such that the signal output has non-linear characteristics with change in frequency.

3,618,368

METHOD AND INSTRUMENT FOR DETERMINING THE MOISTURE CONTENT AND/OR TEMPERATURE OF MOVING MATERIAL

Gerhard Lesemann, Hannover, Germany, assignor to Sina AG fur Instrumentierung und Automatik, Zurich, Switzerland

Filed Sept. 3, 1969, Ser. No. 854,938
Claims priority, application Switzerland, Sept. 6, 1968, 13,427/68
Int. Cl. G01n *25/64*
U.S. Cl. 73—73 16 Claims



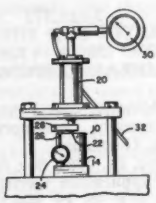
A method and apparatus for measuring the moisture content of a moving material by using a moisture sensing device which supplies an electrical output signal as a function of the value of the moisture being determined. A cover of non-hydroscopic, thermally insulating material is fixedly disposed so as to be slightly spaced from the surface of the moving material. The cover is provided with means for causing the atmosphere passing between the cover and the surface of the material to be drawn off and moved past, and into contact with, the moisture sensing device. The atmosphere, before being moved past the moisture sensing device, is first brought into contact with a temperature varying device for permitting the temperature of the atmosphere to be selectively varied.

3,618,369

APPARATUS AND METHOD FOR TESTING ROCK

William H. Hamilton and Howard J. Handewith, Jr., Seattle, Wash., assignors to Lawrence Manufacturing Company, Seattle, Wash.

Filed Apr. 21, 1970, Ser. No. 30,373
Int. Cl. G01n *3/42*
U.S. Cl. 73—81 15 Claims



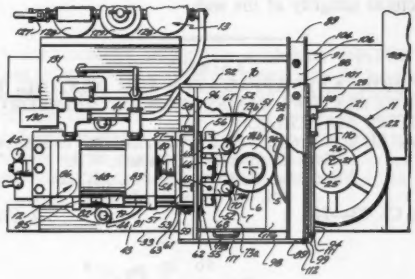
A method for testing rock for its resistance to boring in which a specimen of the rock is fixed on a bearing surface and is stressed with a tool until the specimen exhibits deformation after which the amount of the permanent deformation is measured as is the force which effected the deformation. The invention comprises applying a predetermined force at a predetermined rate or varying rate to the specimen and measuring the resultant arbitrary deformation, as well as applying an increasing force at a predetermined rate or varying rate to the specimen until a predetermined deformation is realized. The invention also comprises novel apparatus for testing rock to determine its resistance to boring with which apparatus can be practiced the inventive methods.

3,618,370

GLASS CONTAINER TEST APPARATUS

Roger D. Dubble, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Oct. 14, 1969, Ser. No. 866,183
Int. Cl. G01d *21/00*
U.S. Cl. 73—88 R 9 Claims



Test apparatus particularly adapted to determine the presence of blemishes or flaws or defects in the side wall of a glass container, which blemishes adversely affect the strength of the side wall. The test apparatus includes, in preferred form, a drive wheel of sufficient width to engage the container's side wall from shoulder to heel at one point on its periphery, and a yoke having an idler roller on each arm of sufficient length to engage the side walls from shoulder to heel at a second and a third point on its periphery, the three points being disposed about the container's periphery such that the container may be gripped therebetween during testing. Further, the test apparatus includes a device to control the force exerted on the container and a device to control the duration of container revolution at that force. Thus, the apparatus functions by controlled rotation of the glass container about its center axis for a preselected period while subjecting the side wall to a preselected and constant external load.

3,618,371

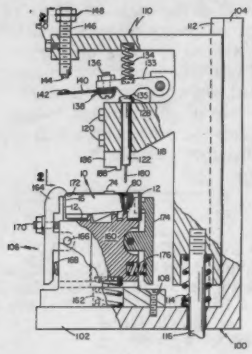
METHOD AND APPARATUS FOR TESTING RESILIENT STRUCTURES

Frank S. Martin, Wenham, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 21, 1969, Ser. No. 852,046
Int. Cl. G01n *3/00*
U.S. Cl. 73—100 3 Claims

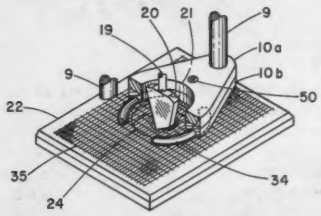
Apparatus for testing a web section which connects two spaced members of an integral molded resilient structure includes a support constructed to receive the structure so that the connecting web is free to flex under the influence of a stressing force. A testing head which includes a probe for engagement with at least one of the spaced members is inserted for movement toward the

support so that the probe will engage that member and flex the web. Movement of the probe relative to the



testing head is sensed and provides an indication of the structural integrity of the web.

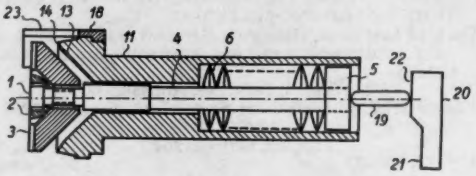
3,618,372
METHOD AND APPARATUS FOR TESTING THE PENETRATION RESISTANCE OF REINFORCED SHEET MATERIAL
Daniel H. Beckstrom, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Mar. 9, 1970, Ser. No. 17,722
Int. Cl. G01n *33/34*
U.S. Cl. 73—102 **2 Claims**



A method and device for measuring the penetration resistance of sheet materials, particularly reinforced sheet materials of the nature of woven or nonwoven fabrics and tissue papers. The method is characterized by holding the strength members of the sheet material which extend in one planar direction in a peripheral area bonding the zone through which a penetrating element is urged while permitting the strength members of the sheet material which extend in the other planar direction to be substantially free. The apparatus for the purpose includes a resilient gripping device which is, together with the penetrative probe, urged by a single means to the sheet material test sample.

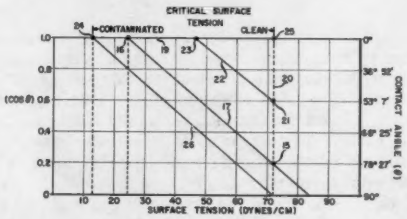
3,618,373
YARN GRIPPER FOR YARN-TESTING MACHINES AND THE LIKE
Albert Peisl, Uster, and Gerold Roos, Esslingen, Switzerland, assignors to Zellweger Ltd., Uster, Switzerland
Filed Oct. 8, 1969, Ser. No. 864,831
Claims priority, application Switzerland, Nov. 8, 1968, 16,677/68
Int. Cl. G01n *3/04*
U.S. Cl. 73—103 **9 Claims**

A yarn gripper for yarn-testing machines and the like, for testing individual yarn lengths in stages, includes a first gripping jaw having a conical gripping surface and a second gripping jaw having a hollow surface complementary to the surface of the first gripping jaw, the two gripping jaws being coaxial and axially displaceable relative to each other. The yarn enters an annular gap tangentially of the conical gripping surfaces in the direction of



a tangent to the conical surface and without any sudden changes in direction. The end face of the second gripping jaw may be designed to function directly as a yarn-guide, and adjustable guide means can be provided to enable the size of the loop inside the annular gap to be varied.

3,618,374
METHOD FOR MEASURING SURFACE CLEANLINESS
Robert N. Miller, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 24, 1969, Ser. No. 809,726
Int. Cl. G01n *13/02, 19/02*
U.S. Cl. 73—104 **4 Claims**

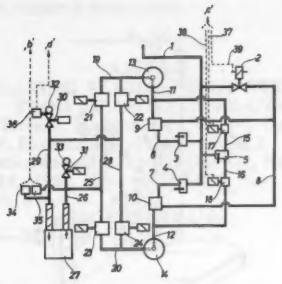


A surface cleanliness measuring technique which is practicable in a field or paint shop environment and which provides a quantitative evaluation of the extent to which unwanted contamination has been removed from a surface. The relation between the critical surface tension of a water droplet of constant volume and the droplet contact angle is established for a desired surface material, and this relation is correlated with the droplet diameter to enable the critical surface tension of the surface material to be determined by measuring the diameter of a water droplet of predetermined volume disposed on the surface.

3,618,375
TEST APPARATUS FOR THE AIR BELLOWS SUSPENSION IN A VEHICLE HAVING A CURVILINEAR RESPONSIVE CONTROL SYSTEM
Hans Pollinger, Munich, and Franz Meir, Nuremberg-Mogeldorf, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany
Filed Dec. 12, 1969, Ser. No. 884,610
Claims priority, application Germany, Dec. 18, 1968, P 18 15 366.7
Int. Cl. G01l *5/22*
U.S. Cl. 73—116 **12 Claims**

A vehicle is provided with a control system for pumping air from the air bellows supporting one side of the

vehicle body to the air bellows supporting the other side of the vehicle body in response to curvilinear or rectilinear travel of the vehicle to maintain the vehicle at its proper angle of inclination. The test apparatus disclosed herein enables the testing of this control system while the vehicle



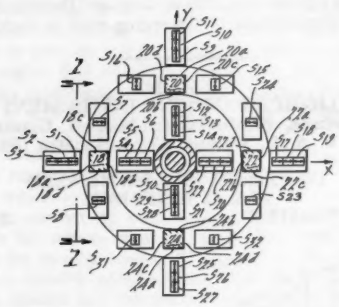
is stationary. The test apparatus simulates tilting of the vehicle and also simulates a measuring voltage in response to this tilting. The proper operation of the various control valves in response to these simulated voltages is then indicated on a number of indicators.

3,618,376

MULTIAXIAL LOAD CELL

Eugene R. Shull, Detroit, and Robert P. Nichols, Mount Clemens, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 19, 1969, Ser. No. 886,610
Int. Cl. G01l 5/16
U.S. Cl. 73—133 11 Claims



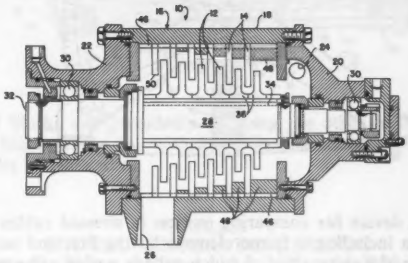
A triaxial load cell comprising a upper load receiving platform portion of generally disc shape, a lower internally threaded rim portion, a plurality of circumferentially spaced column portions of square cross section integrally interconnecting the outer periphery of the upper platform portion and the rim portion, an insert member threadably received within the rim portion, and a plurality of strain gages secured to the side faces of the column portions. The invention cell, when used in impact testing of automotive steering columns, is interposed between the hub of the steering wheel and the steering column shaft with the steering wheel hub threadably secured to the upper face of the platform portion and the usual external splines on the upper end of the steering column shaft engaging with internal splines on the transducer insert member.

3,618,377

TAPERED FLUID DYNAMOMETER

Dnard E. Barker, La Mesa, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Apr. 1, 1970, Ser. No. 24,779
Int. Cl. G01l 3/20
U.S. Cl. 73—134 11 Claims



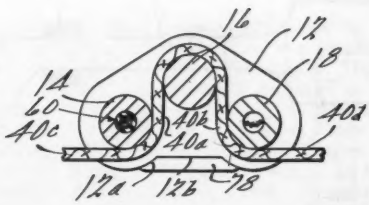
A dynamometer which has a housing provided with a fluid inlet and outlet and enclosing a set of interleaved stator and rotor disks. The disks are fabricated with work holes, the radius of a circle intersecting the centers of said holes gradually increasing from the disks on the inlet side of the housing to the disks on the outlet side to provide a cone shaped centrifugal flow of fluid through the dynamometer.

3,618,378

SEAT BELT TRANSDUCER

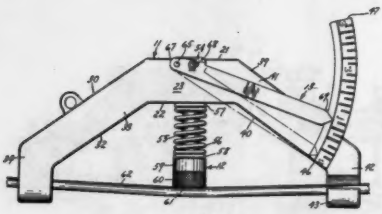
Eugene R. Shull, Detroit, and Robert P. Nichols, Mount Clemens, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 2, 1969, Ser. No. 863,281
Int. Cl. G01l 5/12
U.S. Cl. 73—144 9 Claims



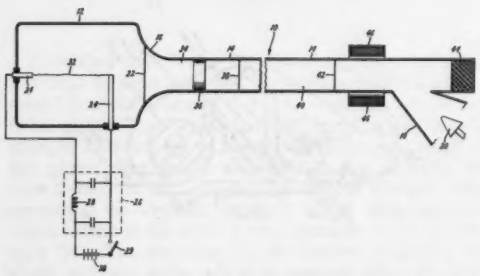
A transducer for measuring seat belt loads comprising two end plates and three parallel spaced bars extending rigidly between the end plates and arranged in an isoceles triangular pattern; the transducer is arranged on the belt with the plane of the first and third bars generally parallel to the plane of the entering and exiting belt portions. The belt enters under the first bar, then passes upwardly over the second bar and then passes downwardly and exits under the third bar so that, upon loading of the belt, the first and second bars are forced apart by the belt tension and the edge face of each end plate opposite the second bar is strained in proportion to the belt load. This strain is sensed and transduced into an electrical readout signal by strain gage means secured to the strained edge faces of the end plates.

3,618,379
TENSIOMETER
Abraham Allen Lipton, Rock Ridge, Mamaroneck, N.Y. 10543
Filed Oct. 31, 1969, Ser. No. 872,845
Int. Cl. G01l *5/06*
U.S. Cl. 73—144 **1 Claim**



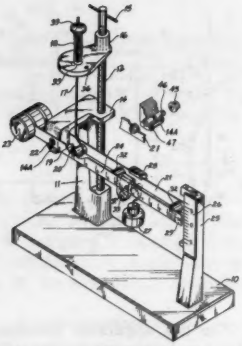
A device for comparing tension in stressed cables and wires including a frame element having first and second arms, the extremities of which engage a wire to be tested at a pair of spaced points along the wire, a central portion of the frame element supporting a resiliently urged plunger which selectively bears against a segment of the wire positioned between the arms, a scale fixed with respect to one of the arms, a pointer pivotally mounted on said frame element at one end thereof and having a free second end cooperating with the scale, pin means interconnecting movement of the plunger and the pointer, whereby the pointer may be used as a lever to position the plunger relative to said segment.

3,618,380
CONTINUOUS DISCHARGE DRIVER FREE-PISTON SHOCK TUNNEL
Charles H. Marston, Berwyn, and Walter R. Warren, Jr., Levittown, Pa., assignors to General Electric Company
Filed Nov. 5, 1968, Ser. No. 773,601
Int. Cl. G01n *9/00*
U.S. Cl. 73—147 **10 Claims**



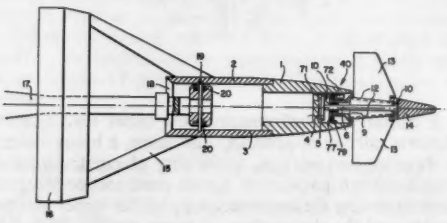
A continuous discharge, non-reflected shock tunnel capable of generating a short duration large scale, high velocity, high density gas flow. The apparatus consists of a gas filled driver chamber in which a high energy capacitor bank is discharged to raise the pressure in the driver, rupture a diaphragm and propel a piston down a connected smaller diameter tube thereby causing a shock wave to develop in front of the piston which compresses and accelerates a test gas within the tube. The capacitor discharge is maintained while the piston is moving to sustain a high gas pressure behind the piston so that it does not decelerate. The test gas then flows through an expansion nozzle to act upon a test body.

3,618,381
SPRING TESTER
Richard E. Beger, 1220 Sunset Ave., Point Pleasant, N.J. 08742
Filed Nov. 24, 1969, Ser. No. 879,340
Int. Cl. G01l *1/04*
U.S. Cl. 73—161 **2 Claims**



A spring tester employing a beam balance biased away from balance by the spring under test. The pivot of the balance is supported by a lateral extension from an upright positioned adjacent the beam. A tension plate is supported by a vertical screw thread which is itself supported by the upright. The spring under test is held by the tension plate when testing compressional springs or by a hook attached to the tension plate when testing springs under tension. The weights and the position on the beam of the weights which are needed to balance the beam biased by the spring determine the force exerted by the spring. Known displacements of the springs are made by adjusting the height of the tension plate and measuring relative positions of same and thereby the force per unit displacement of the spring may be measured.

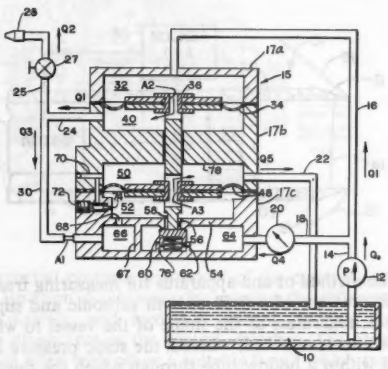
3,618,382
FLIGHT MEASURING INSTRUMENT
Peter Partzsch, Friedrichshafen-Manzell, Germany, assignor to A. G. Dornier, Friedrichshafen (Badensee), Germany
Filed June 19, 1970, Ser. No. 47,829
Int. Cl. G01c *23/00*
U.S. Cl. 73—178 R **3 Claims**



This invention relates to a device for simultaneously measuring the angle of incidence, angle of sideslip, flight path and flying speed of an aircraft which comprises a body, a rotatable nose portion mounted on the body and having propeller blades thereon, a tail assembly mounted on the body, a universal joint mounted in the body in the center of gravity of the device and connecting the body

with a support, means at the universal joint for determining angles of rotation between the support and the body in two orthogonal directions, means in the body for determining the number of revolutions and speed of rotation of the nose portion, means for measuring acceleration, and means for correlating the measured values for acceleration, angle of incidence and angle of sideslip whereby the acceleration vector is determined.

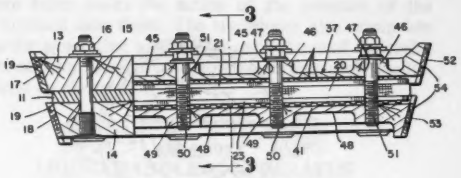
3,618,383
RECIRCULATING FLUID SUPPLY SYSTEM WITH FLOW MEASURING MEANS
Eugene F. Holben, Haddonfield, N.J. (% Grinnell Corp., 260 W. Exchange St., Providence, R.I. 02901)
Continuation-in-part of application Ser. No. 786,594, Dec. 24, 1968. This application Nov. 13, 1969, Ser. No. 876,498
Int. Cl. G01f *5/00*
U.S. Cl. 73—203 **21 Claims**



A recirculating fluid supply system includes a control device for controlling flow in a by-pass portion of the system to provide a measure of the rate of delivery to diesel engine fuel injectors, burners, or other fluid-consumption equipment. A pump supplies fluid from a reservoir to a main conduit and to the by-pass conduit. Fluid is withdrawn from the main conduit through a branch conduit to fluid consuming equipment. The main conduit returns unused fluid to the reservoir. A control device, which is responsive to the rate of fliud flow in the main conduit on both sides of the branch conduit, controls the rate of flow in the by-pass conduit. Fluid flow in the by-pass conduit is supplied to the main conduit at a suitable point whereby fluid flow through the by-pass conduit into the main conduit is at a rate equal to the rate of fluid flow from the main conduit to the fluid consumption equipment. In this manner, a measure of the fluid added through the by-pass conduit is a measure of the fluid consumed.

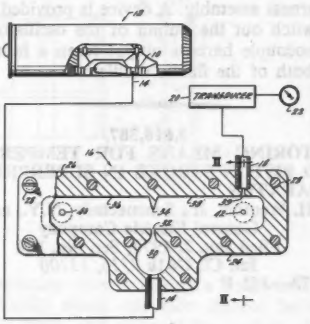
3,618,384
BELT SPLICE FOR V-PULLEY DRIVE
Harry Bierlein, Edinburg, Ind., assignor to Reliance Electric Company, Cleveland, Ohio
Filed Feb. 5, 1970, Ser. No. 8,920
Int. Cl. F16g *5/00, 13/02*
U.S. Cl. 74—234 **6 Claims**

A splice for a longitudinally- and transversely-flexible belt body for use with a V-pulley power transmission device in which the belt must be transversely stiffened, the splice consisting of four identical splice plates of rectangular cross-section rivetted, in registering pairs, to the opposite surfaces of the opposite end regions of the belt body, a pair of splice blocks, each formed with a cavity to receive the splice plates on one surface of the belt, and a plurality of headed screws penetrating one of



said blocks and threadedly engaging the other to clamp the blocks to the belt with the splice plates confined within the block cavities.

3,618,385
FLUIDIC TEMPERATURE SENSOR
Lonny R. Kelley, Ballston Lake, N.Y., and Forbes T. Brown, Cambridge, Mass., assignors to General Electric Company
Filed June 30, 1966, Ser. No. 562,450
Int. Cl. G01k *11/22*
U.S. Cl. 73—339 **5 Claims**

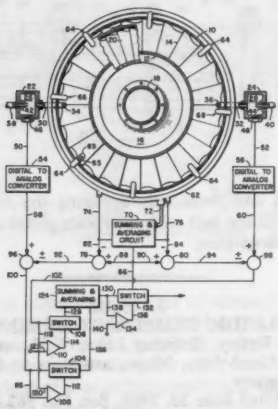


The disclosure shows a temperature sensor for obtaining a measurement of the temperature of a hot gas stream entering the turbine of a gas turbine engine. The sensor comprises a power nozzle which is connected to the hot gas stream of the engine. The fluid stream discharged from this nozzle impinges on a V-shaped divider spaced outwardly therefrom. The divider causes the power stream to alternately pressurize elongated chambers on opposite sides thereof. These chambers are vented by vents having a combined area approximately one-half the area of the nozzle. An output pressure signal is derived from one of the chambers. The rate at which this pressure signal varies gives an accurate measurement of the temperature of the hot gas stream in the turbine engine. A transducer is employed to provide an analog readout of the measurement.

3,618,386
FLUIDIC TEMPERATURE SENSOR AVERAGING SYSTEM
Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed June 10, 1970, Ser. No. 44,979
Int. Cl. G01k *3/06, 11/22*
U.S. Cl. 73—340 **6 Claims**

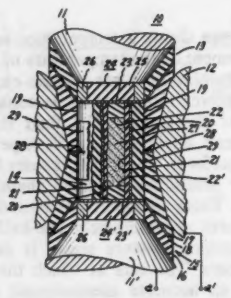
Simplified fluidic temperature sensor assembly for measuring average turbine inlet temperature of a gas turbine engine. The system comprises a pair of fluidic

oscillators positioned at the inlet to a turbine nozzle of a gas turbine engine. The output from the oscillators is modified in proportion to the difference in signal between thermocouples adjacent the oscillators and the signal re-



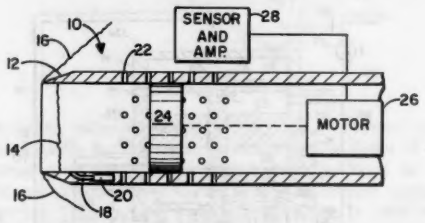
flecting an average temperature produced by a thermocouple harness assembly. A device is provided in the system to switch out the output of the oscillators and use the thermocouple harness output when a failure is indicated in both of the fluidic oscillators.

3,618,387
MONITORING MEANS FOR TEMPERATURE AND PISTON STROKE IN SUPERPRESSURE APPARATUS
Robert H. Wentorf, Jr., Schenectady, N.Y., assignor to General Electric Company
Filed Jan. 2, 1970, Ser. No. 136
Int. Cl. G01k *7/16, 13/00*
U.S. Cl. 73—343 R **3 Claims**



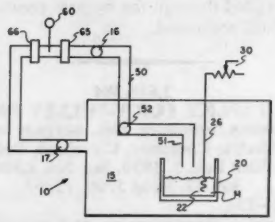
A simple device for monitoring temperatures and piston stroke in a high pressure, high temperature apparatus is disclosed. In a "belt-type" apparatus a metal wire is looped around the reaction vessel, the ends of the wire are twisted together and extended through the surrounding gasket assembly so as to make electrical contact with the surface of the die. Electrical leads are attached to the die and to the punch, which is in turn in electrical contact with the heater tube (indirectly heated cells) or the material to be subjected to the high pressure, high temperature process (direct heating). By employing either D.C. or low frequency A.C. electrical measuring means, the electrical resistance between the wire loop and the heater tube (or electrically conducting charge) may be measured. This electrical resistance changes as a function of the temperature within the reaction cell. By employing high frequency A.C. current measuring means, the electrical capacity between the die and a metallic gasket may be measured. Its value will depend upon the gasket material located therebetween and the separation distance between the metallic gasket and the die. By the latter described measuring means the stroke of the piston (electrically connected to the intermediate metallic gasket) may be monitored.

3,618,388
CONTROL APPARATUS
Raymond E. Rose, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 5, 1969, Ser. No. 821,821
Int. Cl. G011 *7/00*
U.S. Cl. 73—388 **10 Claims**



The method of and apparatus for measuring free stream static pressure of a fluid at both subsonic and supersonic speeds, regardless of the shape of the vessel to which the apparatus is attached, wherein the static pressure is measured within a hollow tube through which the fluid passes. The position of normal shock within the tube is controlled by varying the size or number of the outlets in the tube. The free stream static pressure is thus determined by utilizing known relationships between the actual free stream static pressure and the measured static pressure for that approximate speed. The approximate speed is measured by a separate sensor which may be a part of or separate from the tube.

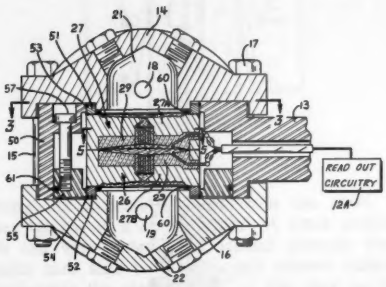
3,618,389
APPARATUS AND METHOD FOR DETECTING A VACUUM AND THE QUALITY THEREOF
David H. Martin, 820 Merrie Road, Raleigh, N.C. 27606
Filed Sept. 22, 1969, Ser. No. 859,733
Int. Cl. G011 *7/00*
U.S. Cl. 73—388 **8 Claims**



Apparatus and method for determining the gas pressure and/or quality of a vacuum comprising a vacuum source, a thermally insulated container under the influence of the vacuum, thermal sensors associated with said insulated

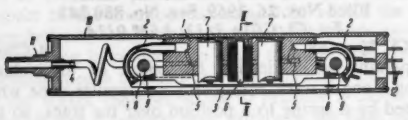
container and a medium in said container to be thermally sensed. Thermal sensing of the medium is directly related to the removal of vapor from the medium. After the medium is sensed, corresponding saturated vapor pressures are obtained from standard tables and plotted along a linear graph of saturated vapor pressure versus air pressure to predict the quality of the vacuum system, i.e. vapor removal ability of the vacuum system.

3,618,390
DIFFERENTIAL PRESSURE TRANSDUCER
Roger L. Frick, Minneapolis, Minn., assignor to Rosemount Engineering Company, Eden Prairie, Minn.
Filed Oct. 27, 1969, Ser. No. 869,657
Int. Cl. G01l *9/12, 13/06*
U.S. Cl. 73—398 C **22 Claims**



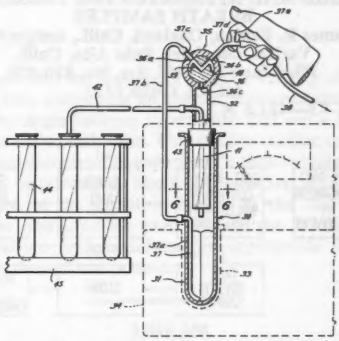
A differential pressure transducer of the capacitor type utilizing isolation diaphragms for sensing the differential pressure directly, and having a central chamber with a sensing diaphragm in the central chamber. The central chamber is filled with oil or a suitable liquid which transmits pressure from the isolation diaphragms to the sensing diaphragm. The sensing diaphragm forms a capacitor plate, and the walls of the chamber adjacent to the sensing diaphragm also form capacitor plates. The pressures are transmitted to the sensing diaphragm through the oil so that only differential pressure is sensed between the two isolation diaphragms. The sensing diaphragm and its chamber are made so that any excessive pressure causes the sensing diaphragm to bottom out against its mounting chamber surfaces. The unit is made extremely stable, by using a relatively massive metal housing with a glass center portion fused thereto, and depositing the metallic capacitor plate material right onto the glass surfaces which form the sensing chamber.

3,618,391
PRESSURE TRANSDUCER
Ilia Yakovlevich Rivkin, Ulitsa Marshala Tukhachevskogo 38, korpus 2, kv. 47, and Evgeny Vasilievich Ovcharov, Novye Cheremushki, kvartal 206, korpus 102, kv. 21, both of Moscow, U.S.S.R.
Filed Nov. 14, 1969, Ser. No. 876,828
Int. Cl. G01l *9/10*
U.S. Cl. 73—398 R **5 Claims**



A pressure transducer comprising a pair of identical pressure tubes having stationary ends mounted on a common base member and into which fluid under pressure which is to be measured can be supplied. The movable ends of these pressure tubes are connected by a resilient connecting member, whereby the tension of this resilient connecting member is varied by the deformation of these pressure tubes under the action of the pressure of the fluid supplied into them. The transducer also comprises means for generating mechanical oscillations of the resilient connecting member and for converting such oscillations into an electromotive force.

3,618,392
LIQUID HANDLING APPARATUS
Harry A. Echols, 2410 Wordsworth, Houston, Tex. 77025
Continuation-in-part of application Ser. No. 574,879, Aug. 11, 1966, which is a continuation-in-part of application Ser. No. 483,564, Aug. 30, 1965. This application Feb. 12, 1968, Ser. No. 706,751
Int. Cl. G01n *1/10*
U.S. Cl. 73—421 R **2 Claims**

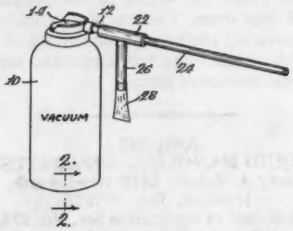


A self-evacuating cuvette having a small tube extending longitudinally along one side thereof between an opening in its lower end adjacent the bottom of the cuvette and level above the viewing area of the cuvette. At the upper level, the small tube extends laterally to a second opening in its other end outside of the cuvette. A tubular portion of the small tube connects at one end with its lateral extent thereof to provide a third opening in its other end. When the second opening is connected with a source of suction, and third opening is closed, as by a person's thumb, liquid may be suctioned out of the cuvette. In one modification of the cuvette, there is a check valve in the lateral extent between the second opening therein and the intersection therewith of the tubular portion to prevent back flow into the cuvette. In another modification of the cuvette, a means is provided for automatically pouring a sample into the cuvette.

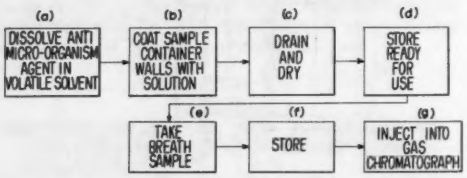
3,618,393
GAS SAMPLING APPARATUS AND METHOD
Andrew H. Principe, 5824 N. Newark, Chicago, Ill. 60631, and Emmett P. Glynn, Rte. 1, Lemont, Ill. 60439
Filed Feb. 27, 1969, Ser. No. 802,880
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 R **8 Claims**

Apparatus and method for taking samples of suspect gases, such as the breath of alveolar or deep lung air of drunk driving suspects and drugged race horses, gaseous products of combustion from suspected arsons and from explosions, air polluted by commercial exhausts, etc., and the facilitating scientific analysis thereof for example

by gas chromatographic methods; characterized by a sample securing device comprising an evacuated canister having an inlet, a valve controlling said inlet and accommodating selective intake of gas into said canister, and a septum in said canister accommodating hypodermic extraction of gas from said canister.

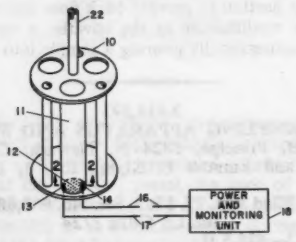


3,618,394
METHOD AND APPARATUS FOR PRESERVING BREATH SAMPLES
James R. Penton, Oakland, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed June 24, 1969, Ser. No. 836,070
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R 9 Claims



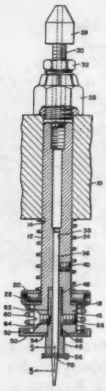
A breath sample suspected of containing volatile organic material, such as alcohol, capable of being degraded by metabolic activity of micro-organisms such as bacteria present in the breath, is captured in a container which also contains an anti-micro-organism agent for terminating or substantially delaying the activity of the micro-organisms, thereby preserving the organic material in the breath.

3,618,395
TABLET DISINTEGRATION APPARATUS
Guido W. Melliger, 9 Country Lane, % Welsh, Mendham, N.J. 07945
Filed Apr. 9, 1970, Ser. No. 26,896
Int. Cl. G01n *19/00*
U.S. Cl. 73—432 10 Claims



This invention provides an improvement in a tablet disintegrating apparatus, by providing a plurality of opposed spaced electrodes at the base of the tablet containing tubes. In the operation of the apparatus an electric field is set up between the electrodes. The presence of a tablet disturbs this electric field, which disturbance actuates a recording device such as a timer. The conventional reciprocating vertical motion of the apparatus (in an aqueous bath) causes the tablet to disintegrate. At the end point of the tablet disintegration, the undisturbed flow of current between the electrodes stops the recording device, noting the interval of time for tablet disintegration.

3,618,396
DETECTION OF HOLES IN A WORKPIECE
Denis Julien, Limoliou, Quebec, Canada, assignor to Valcartier Industries, Inc., Courcelette, Quebec, Canada
Filed June 3, 1970, Ser. No. 42,956
Int. Cl. B07c *5/00*
U.S. Cl. 73—432 13 Claims

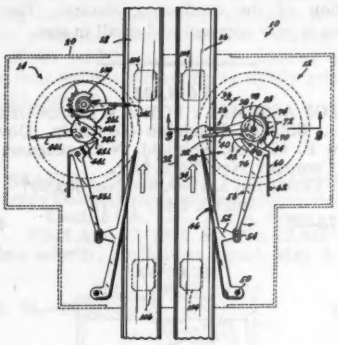


A method and apparatus for detecting the presence of a relatively small hole in a workpiece, such as a bullet casing, by passing a slender detect pin through the hole. If the hole is obstructed or non-existent, the pin abuts the workpiece which terminates, prematurely, advancement of the pin. A sensing device is provided and is responsive to premature termination of the pin advancement to control a machine performing various operations on the member. Absence of the hole in the member is employed to stop the machine and enables the defective workpiece to be removed. Additionally, the device includes a safety feature by which, in the event that the slender, fragile pin breaks, the breakage will be sensed also to stop the machine. This enables the broken pin to be replaced and insures that the damaged pin will not permit any defective workpiece having no hole to pass through the detecting station to subsequent operating stations in the machine.

3,618,397
SPEEDOMETER FOR TOY VEHICLES
Denis V. Bosley, Palos Verdes Peninsula, Derek J. Gay, Redondo Beach, Harvey W. LaBranche, Palos Verdes Peninsula, and Toshio Yamasaki, Gardena, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 26, 1969, Ser. No. 880,243
Int. Cl. G01p *3/12*; A63f *9/14*
U.S. Cl. 73—488 9 Claims

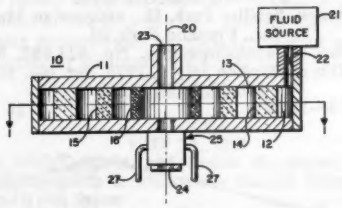
Apparatus for indicating the speed of toy vehicles moving along a track comprising an impulse vane which is biased by a spring to a position over the track, so that the speed of a toy vehicle hitting the vane determines how far it will be pivoted against the spring force. The vane turns an indicator wheel with a pointer extending therefrom which moves over a scale to indicate the speed of

the vehicle. A pawl which engages ratchets on the indicator wheel retains it at the furthest position to which it has been moved by the vane. A resetting lever is positioned uptrack from the vane so it is hit by a vehicle prior to the vehicle hitting the vane, the resetting lever



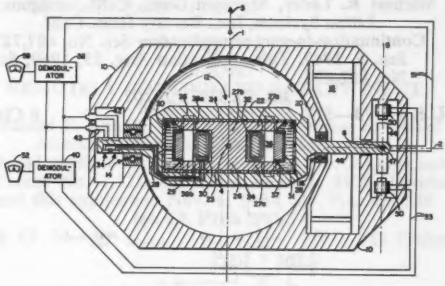
releasing the indicating wheel from the pawl, so the pointer returns to a zero position. A track section over which the vane extends is banked towards the vane to make sure that both wide and narrow vehicles hit approximately the same portion of the vane, to increase accuracy.

3,618,398
FLUID VORTEX DEVICE
Walter M. Posingies, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 7, 1970, Ser. No. 1,106
Int. Cl. G01p *3/26*
U.S. Cl. 73—505 **9 Claims**



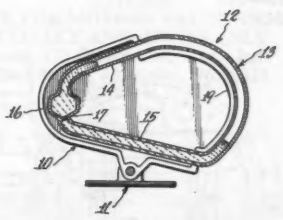
Fluid vortex apparatus comprising a housing enclosing a vortex chamber, a primary coupling element surrounding the vortex chamber, a central fluid outlet from the vortex chamber, and secondary coupling means located within the vortex chamber between the primary coupling element and the central outlet. The primary coupling element is structured to introduce fluid into the vortex chamber so that it has substantially no rotational velocity with respect to the chamber housing, fluid within the vortex chamber acquiring a rotational velocity with respect to the housing in response to input stimulii. The secondary coupling means modifies any rotational flow pattern within the vortex chamber so as to produce a characterized time-varying rotational flow pattern in the fluid outlet. A sensor in the outlet produces a signal indicative of the rotational velocity of flow about the axis of the outlet, thereby resulting in a characterized response to the input stimulii.

3,618,399
ANGULAR RATE SENSOR
Vernon H. Aske, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of application Ser. No. 785,256, Dec. 19, 1968. This application Oct. 20, 1969, Ser. No. 867,450
Int. Cl. G01c *19/42*; G01p *3/26*
U.S. Cl. 73—505 **3 Claims**



An apparatus for measuring angular velocity about one or more axes comprising an angular accelerometer rotated so that the angle between its sensitive axis and a measurement axis varies with time. This relative motion causes the angular accelerometer to experience a time-varying angular rate, i.e., acceleration, about its sensitive axis, with a component of its output indicative of the rate existing about the measurement axis. The output of the fundamental device is demodulated by appropriate means to select the desired component.

3,618,400
GRADE AND ACCELERATION-DECELERATION INDICATING DEVICE
Walter E. Hull, R.D. 4, Box 67, Cortland, Ohio 44410
Filed May 5, 1969, Ser. No. 821,768
Int. Cl. G01p *15/00*
U.S. Cl. 73—515 **11 Claims**

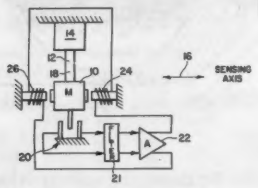


A device adapted to be mounted on a vehicle for indicating the grade of terrain being traversed and for indicating the instantaneous rate of acceleration and deceleration of such vehicle. The device comprises an elongated conduit containing a liquid whose level within the conduit is responsive to gravity and to the inertial forces of acceleration and deceleration. Such inertial forces raise and lower the level of the liquid relative to a reference point, depending upon the direction of force application, an amount proportional to such forces.

In series with the liquid-containing conduit is a radially enlarged chamber adapted to be completely filled with the indicating liquid, but short of overflowing, when the vehicle is at rest on a level surface at which time the

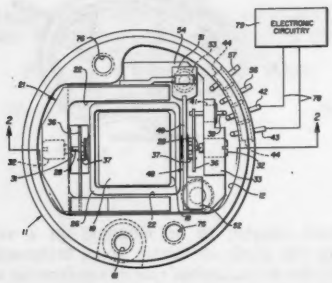
liquid level coincides with the reference point. The chamber aforesaid, as a result of its relatively large cross-sectional size, functions to increase the change of level of the indicating liquid under the application of an inertial force in one direction over the change of liquid level under the application of an equal but oppositely applied inertial force.

3,618,401
ACCELEROMETER
Michael R. Lacey, Sherman Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Continuation-in-part of application Ser. No. 607,727, Jan. 6, 1967. This application Aug. 25, 1969, Ser. No. 852,694
Int. Cl. G01p *15/02*
U.S. Cl. 73—517 **6 Claims**



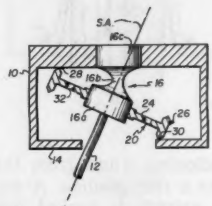
A pendulous accelerometer sensing mass which is elastically constrained against translation in an X-Y plane and rotationally constrained in the X-Y plane by a servo mechanism, adapted to sense acceleration in the X direction, in which the anisoelastic torques and the cross coupling or vibropendulous rectification torques, in the presence of an acceleration in the X-Y plane at an angle to the X axis, compensate each other.

3,618,402
SENSING MECHANISM FOR LINEAR SERVO ACCELEROMETER
Heino Kase, Walnut Creek, Calif., assignor to Systron-Donner Corporation, Concord, Calif.
Continuation of application Ser. No. 559,166, June 21, 1966. This application Sept. 23, 1969, Ser. No. 861,227
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 **2 Claims**



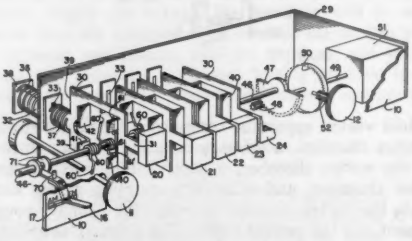
Sensing mechanism for linear servo accelerometer having a body with a surface and with a magnet and a yoke mounted on the surface to form an air gap of a substantially constant width between the magnet and the yoke through which magnetic lines of flux pass. A force coil is disposed in the air gap and is in the form of a closed loop lying in a plane with an opening extending therethrough in a direction perpendicular to the plane. Means is provided exterior of the maget for pivotally mounting the force coil about an axis lying in the plane in the coil. The magnet extends through the opening in the coil and has a substantially planar surface which is generally parallel to and in relatively close proximity to the plane. A conducting non-magnetic element is secured to the force coil for movement with the force coil and a pick-off coil is mounted on the surface of the body for sensing the position of the conducting element. The sensing mechanism is very compact and small in size.

3,618,403
STOP ASSEMBLY FOR A GYROSCOPE
Donald J. Bilinski, Randolph Township, Dover, and Richard F. Cimera, Fairfield, N.J., assignors to The Singer Company, New York, N.Y.
Filed Mar. 3, 1969, Ser. No. 803,907
Int. Cl. G01c *19/18*
U.S. Cl. 74—5 **6 Claims**



A stop assembly for a gyroscope having a unitary mass member rotated by means of a drive shaft and connected to the shaft by means of a flexible connection member to permit universal tilting movement between the mass member and the shaft member. A stop means is mounted with respect to a least one of the members and is adapted to engage another of the members to stop the tilting movement after a predetermined amount thereof.

3,618,404
TUNING MECHANISM
Harold Tyzack, Schiller Park, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Continuation of application Ser. No. 821,580, May 5, 1969. This application July 6, 1970, Ser. No. 56,138
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.37 **16 Claims**

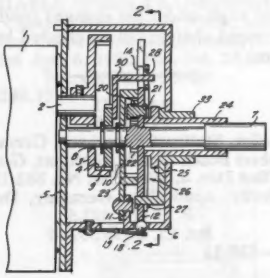


The push-button mechanism for operating the tuner of an AM/FM radio receiver includes five push-buttons for selecting ten stations, five AM stations and five FM stations. An axially moveable tuner control shaft has ten wire springs, two for each push-button, wound thereabout, with the ends extending in opposite directions on the same side of the shaft. When a push-button is depressed, a vertical shaft positioning tab engages one or both of the extensions of one of the two springs associated with the push-button in a direction to cause the spring

to more tightly grip the shaft, thereby rotating the shaft and the spring together to select the station indicated by the vertical position of the spring on the shaft.

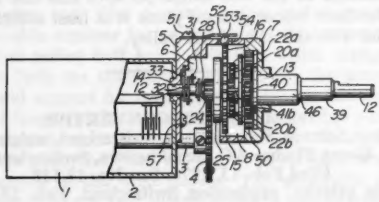
When the shaft is rotated to a position corresponding to a station to be subsequently selected by a particular push-button, the push-button may be pulled out; and memory reset tabs on the push-button slide engage one or both of the spring extensions in a direction to cause the spring to be released from the shaft to rotate the spring to a vertical position without rotating the shaft. Return of the push-button slide mechanism to a center position then permits the spring to tightly grip the shaft in this new position.

3,618,405
STATION SELECTING MECHANISM
Teruzo Ishida, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Apr. 17, 1970, Ser. No. 29,442
Claims priority, application Japan, May 1, 1969, 44/34,236
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.52 **11 Claims**



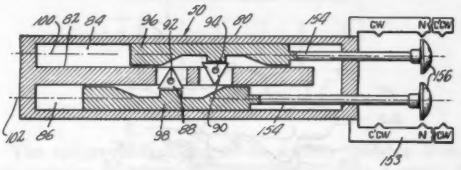
A station selecting mechanism, particularly well adapted for UHF reception, provides for detented coarse tuning and for fine tuning within the detented setting, the coarse tuning being accomplished through a gearing arrangement driven by a detented member and the fine tuning being accomplished by means of a cam acting on a lever carried by the detented member.

3,618,406
UHF TUNER
Etsuzo Mohri, Osaka, and Toshio Hayakawa, Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 12, 1970, Ser. No. 63,118
Claims priority, application Japan, Aug. 14, 1969, 44/64,606
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.54 **2 Claims**



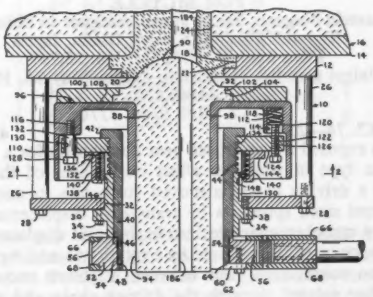
A UHF tuner comprising a main switch-over shaft to switch channels, a disk secured to the main switch-over shaft and formed with radially spaced peripheral notches or indentations, against which a ball is forced as the main switch-over shaft is rotated, a member coupled with a rotor shaft, coupling members integrally having gears and pins eccentric with respect to said gears, and a fine adjustment sleeve mounted on the main switch-over shaft and provided at one end with a gear, wherein the coupling members are inserted through respective openings formed in the disk, the eccentric pins of the coupling members extend within respective openings formed in the member, and the gears of the coupling members mesh with the gear of the fine adjustment sleeve.

3,618,407
REMOTELY CONTROLLED ROTARY INPUT SIGNAL MEANS
Armand F. Amelio, Yonkers, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.
Original application Sept. 23, 1968, Ser. No. 761,644, now Patent No. 3,521,448, dated July 21, 1970. Divided and this application Nov. 6, 1969, Ser. No. 871,245
Int. Cl. F16h *27/02*
U.S. Cl. 74—88 **13 Claims**



A remotely controlled rotary input signal means comprising a regular polygon mounted for rotation and a selectively contoured cam member translatable in opposite directions with respect to the polygon and contoured so as to lock the polygon in neutral position when centered and so as to cause the polygon, and the shaft attached to the polygon, to rotate two increments in one direction as the cam member is moved leftwardly and then back to center, or to cause the polygon to rotate two increments in the opposite direction as the cam member is translated rightwardly and then back to center.

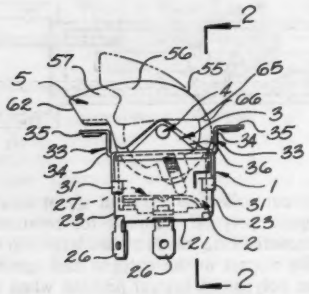
3,618,408
DEVICE FOR MOVING VALVE MEMBER AXIALLY AND ANGULARLY
Christ Koseff, 525 Carolina St., Gary, Ind. 46402
Filed Feb. 3, 1970, Ser. No. 8,331
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **16 Claims**



A device for moving a closure body such as a valve stopper axially into a seated position, then rotatively to position the valve stopper at a select angular position,

comprising a cylindrical member which is rotatably supported in a frame. The cylindrical member is threaded at one end for engaging thereon a ring collar which is axially movable thereover when the cylindrical member is rotated by drive means connected to the other end thereof. Ring collar supports and carries therewith the closure body. When the axial limit of ring collar is reached, ring collar locks with the cylindrical member and rotates therewith for placement thereof at the select angular position. When the cylindrical member is reversed in rotation, a clutch element is provided to restrain the ring collar from rotating therewith and travels on the threads of the cylindrical member in the opposite axial direction to release the closure body from its seated position.

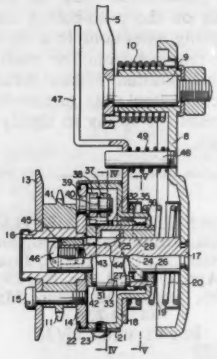
3,618,409
SAFETY SWITCH
Ralph W. Shifley, Normandy, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Sept. 30, 1969, Ser. No. 862,368
Int. Cl. F16h *21/54*
U.S. Cl. 74—102 **7 Claims**



In a standard rocker type "on-off" switch, a switch lever is provided which is asymmetrical with respect to the pivot axis, with an accessible projection in the direction of the "off" position greater than in the direction of the "on" position with respect to the pivot axis, so that the switch is most readily moved to the "on" position by grasping sides and lifting up of the projetcion of the lever in the "off" direction, a relatively difficult manpulation, and is readily moved to the "off" position by pressure against the lever.

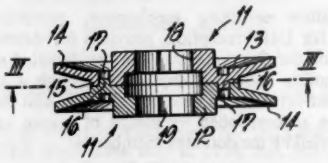
3,618,410
EXPOSED CHANGE SPEED GEAR MECHANISM FOR BICYCLE
Masashi Nagano, Sakai, Japan, assignor to Shimano Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 8, 1970, Ser. No. 35,757
Claims priority, application Japan, May 26, 1969, 44/40,870
Int. Cl. F16h *9/24, 11/06*
U.S. Cl. 74—217 B **4 Claims**

An exposed change speed gear mechanism for a bicycle, of the type in which to effect changeover of the speed ratio a driving chain is moved from one to another of different sized sprockets by translative displacement of a jockey sprocket, characterized in that said displacement of the jocky sprocket is caused by a rotational- and rectilineal-motion mechanism, and between a power transmission member rotated through the driving chain and a driven member of said rotational- and rectilineal-motion mechanism, there are arranged in series a one-way clutch means, and a pair of clutch means for transmitting respective forward and backward rotation of said power transmission member to said one-way clutch means, each of said pair of clutch means being adapted to be automatically brought out of engagement when having been rotated through a



predetermined angle under the engaged condition thereof, whereby the speed change can be effected by back-pedalling operation.

3,618,411
PULLEY
Willy Rottweiler, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Dec. 4, 1969, Ser. No. 882,100
Claims priority, application Germany, Dec. 7, 1968, P 18 13 427.5
Int. Cl. F16h *55/46*
U.S. Cl. 74—230.11 **12 Claims**

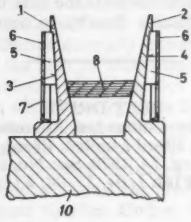


Two identical pulleys halves are mirror-symmetrically arranged relative to each other and each comprises an annular hub portion having an annular axial projection on its inner end face, and a flange portion projecting outwardly from the hub portion and with the respective flange portions axially inclined in direction away from each other. The annular projections are abuttingly connected to each other and together define an outer circumferential surface which is located intermediate and within the confines of the two flange portions and has at least one flat facet whose general plane is at least substantially parallel with the axis of the pulley.

3,618,412
V-BELT SPEED CONVERTER
Albert Schmid, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland
Filed Feb. 13, 1970, Ser. No. 11,138
Claims priority, application Switzerland, Feb. 25, 1969, 2,805/69
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **6 Claims**

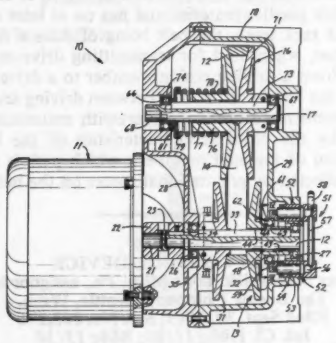
A V- or cone belt-speed converter of the type wherein one cone pulley disc of each cone belt pulley disc is axial-

ly displaceable, and wherein the cone pulley discs, viewed in axial direction, are provided with blades or vanes at the side surfaces of the cone belt pulley discs. These



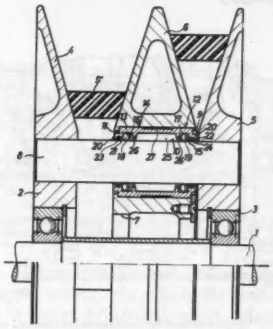
vanes are directed outwardly for the purpose of generating an at least approximately radially extending air current which is directed over the side surfaces.

3,618,413
VARIABLE SPEED TRANSMISSION
James L. Cherpes, Kalamazoo, Mich., assignor to Clausing Corporation, Kalamazoo, Mich.
Filed Apr. 6, 1970, Ser. No. 25,892
Int. Cl. F16h *55/22*
U.S. Cl. 74—230.17 A **11 Claims**



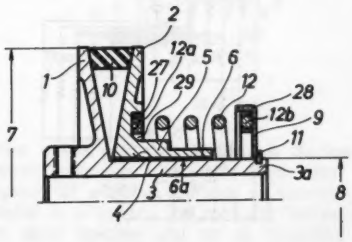
A variable speed transmission having an input shaft coaxially aligned with a driving motor and supported adjacent its opposite ends by antifriction bearings. The input shaft has an adjustable pulley assembly nonrotatably secured thereto, which pulley assembly includes a fixed pulley half secured to the shaft and a movable pulley half slideably mounted on the shaft for rotation therewith and for movement toward and away from the fixed pulley half. The movable pulley half is connected to a suitable actuator for adjustably axially moving same. The fixed pulley half has a split hub which clampingly engages both the shaft and a driving key for providing additional support for said key. The driving key extends the full length of both pulley halves to further stabilize the assembly and minimize hammering between the moveable pulley half and the key upon starting, stopping or reversing of the drive means. The adjustable pulley assembly drives a belt which drives a spring-tensioned pulley assembly mounted on an output shaft. The driving and driven pulley assemblies and the input and output shafts are preferably constructed of aluminum to minimize inertia.

3,618,414
VARIABLE V-BELT TRANSMISSION
Robert Ruprecht, Aichelberg, Kreis Esslingen (Neckar), Germany, assignor to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany
Filed Oct. 27, 1969, Ser. No. 869,587
Claims priority, application Germany, Oct. 25, 1968, P 18 05 102.0
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **12 Claims**



The reciprocable flange of an endless variable V-belt transmission is axially movably mounted on a series of axially parallel guide rods by means of a plurality of roller bearing elements pairwise accommodated and retained in axially spaced circumferential grooves of a one-piece hub member fixedly mounted in the reciprocable flange.

3,618,415
ADJUSTABLE PULLEY
Robert Ruprecht, Raidwangen, Kreis Nurtingen, and Heinrich Grimm, Aichelberg, Kreis Esslingen (Neckar), Germany, assignors to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany
Filed Nov. 17, 1969, Ser. No. 877,397
Claims priority, application Germany, Nov. 15, 1968, P 18 09 065.8
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **13 Claims**

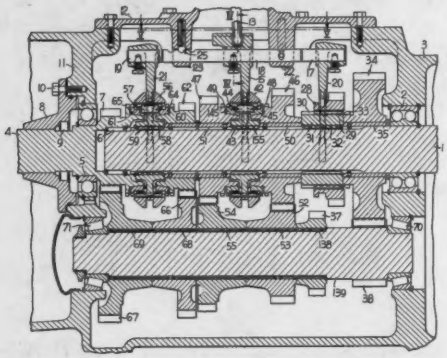


A stationary flange is fixed on a shaft which has an outer cylindrical surface and a reciprocable flange is mounted on the shaft for axial movement away from the stationary flange against a biassing force. The reciprocable flange has an inner peripheral surface which spacedly surrounds the outer cylindrical surface of the shaft and a liner of a self-lubricating slidable plastic material is confined between and in contact with both of the surfaces.

ERRATUM

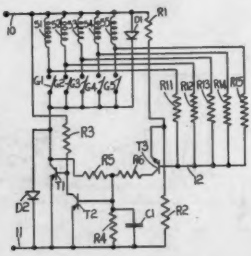
For Class 74—234 see:
Patent No. 3,618,384

3,618,416
MULTIPLE SPEED TRANSMISSION
Donald W. Longshore, New Berlin, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Jan. 2, 1970, Ser. No. 274
Int. Cl. F16h *3/08*
U.S. Cl. 74—333 **10 Claims**



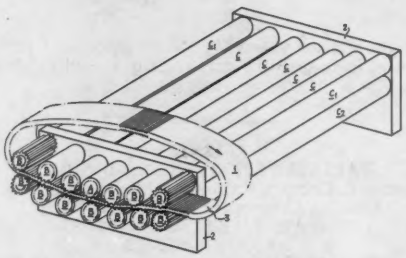
A multiple speed transmission having a shift mechanism for operating a combination clutch sleeve and gear to selectively operate the transmission in forward and reverse.

3,618,417
VEHICLE TRANSMISSION MECHANISM INCORPORATING GEAR RATIO INTERLOCK
Robert Hulme Brown, Kingston-upon-Thames, England, assignor to C.A.V. Limited, London, England
Filed Oct. 7, 1969, Ser. No. 864,507
Claims priority, application Great Britain, Oct. 15, 1968, 48,843/68
Int. Cl. H01h *47/32*; F16h *3/08*
U.S. Cl. 74—365 **2 Claims**



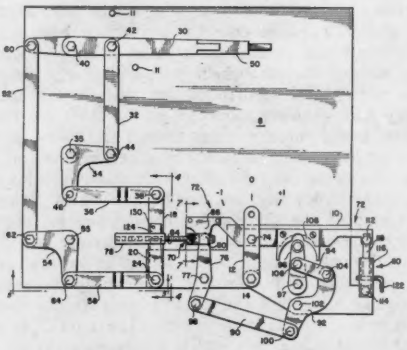
This invention relates to a transmission mechanism for a road vehicle and of the kind which includes a multi-ratio gear box and in which the ratios are selected by energisation of one of a number of solenoids the solenoids being controlled respectively by switches. With this system it is essential to ensure that two switches are not closed at once and for this purpose there is associated with the solenoid windings respectively a plurality of resistors which are connected to a common point the potential of which relative to the junction between a pair of series resistors will be low when only one of the switches is closed and will be high when two of the switches are closed, there being provided a transistor in series with the switches and a further transistor which senses the voltage at said point the arrangement being that when the further transistor conducts the first transistor will be rendered non-conductive thereby to deenergise the solenoids.

3,618,418
BELT DRIVE
Frank Victor Henry Chittenden, Mountnessing, England, assignor to Ilford Limited, Ilford, England
Filed Aug. 24, 1970, Ser. No. 66,414
Int. Cl. F16h *1/04, 55/04*; F16g *1/28*
U.S. Cl. 74—422 **7 Claims**



This application describes an endless positive-drive toothed belt which is characterized in that it is composed of a flexible plastics material and has on at least one face a series of rack teeth, the belt being of such a degree of rigidity that, when used for transmitting drive as a moving rack from a driving pinion member to a driven pinion member, the length of the belt between driving and driven pinion members co-operating therewith maintains a path dictated by the physical characteristics of the belt and the location of the said members, which path is substantially unaffected by gravitational forces on the belt.

3,618,419
GAIN CONTROL DEVICE
Max Maroshick, Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Sept. 30, 1969, Ser. No. 862,276
Int. Cl. G05g *11/00*; B64c *13/30*
U.S. Cl. 74—479 **17 Claims**



A gain control device is provided for use in a failure correction control system in which the device receives two mechanical input signals during failure-free operation of

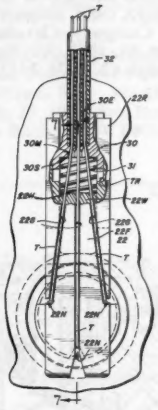
the control system, and combines these signals to produce an output. The device includes two independent force transmission means which can comprise a series of pivotally connected levers. Each force transmission means includes an input element that receives a separate input signal which is transmitted to a whiffletree that is mounted for pivotal and translational movement relative to a frame. The whiffletree normally transmits a signal that is proportional to the sum of both input signals through a first force transmission channel which connects an output member and the whiffletree. If a jam failure occurs in one of the input signals, shift means are provided to connect the whiffletree and the output member through a normally disengaged second channel that increases the gain of the unfailed signal and transmits the resulting full authority signal to the output member. Output adjusting means are provided for varying the relative locations of the output member and the whiffletree and hence for varying the location of the range of movement of the output member to insure that a proper range of output is available after the failure. The device also includes disconnect failure accommodation means which releasably engage the whiffletree to prevent pivotal movement of the whiffletree after a disconnect failure has occurred and to thus cause the output member to move through its full range of movement.

3,618,420

MECHANICAL REMOTE CONTROL APPARATUS

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Jan. 7, 1970, Ser. No. 1,177
Int. Cl. F16c *1/10*
U.S. Cl. 74—501 M **16 Claims**



Mechanical remote control apparatus for transmitting universal movement utilizes a flexible control line containing three cables trained between a control unit swivel bearing and a controlled unit swivel bearing. The control line has a guide sheath of nylon plastic having a set of three guide passages extending in parallel lengthwise relation. For complex control line paths such as in remote outside rear view mirror systems for automobiles, the guide sheath is of oblong section to provide preferential bending in one plane and the guide passages are disposed in a common longitudinal plane determined by the major bend axis of the oblong section.

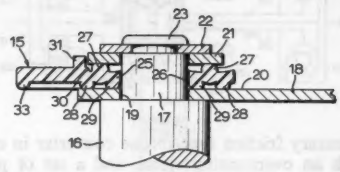
The swivel bearing units include a segmented pivot ball structure, a right angle cable guide bracket, a common adaptor and bias spring for anchoring the sheath in endwise compression and snap-fit connections for molded plastic parts.

3,618,421

TELEPHONE RINGER CAM

Tadeusz Pecak, London, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Mar. 13, 1970, Ser. No. 19,316
Int. Cl. F16h *53/00*
U.S. Cl. 74—567 **6 Claims**



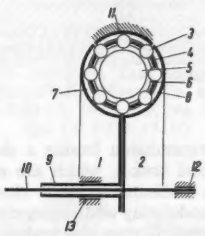
A cam for varying the loudness of telephone ringers by limiting clapper travel, said cam being made of resilient material with a series of spaced apart ridges extending from either side to abut upon adjacent mounting surfaces and compensate for the variations in torque which result from cumulative tolerance variations and differing cam positions.

3,618,422

ROLLER WORM GEAR ARRANGEMENTS

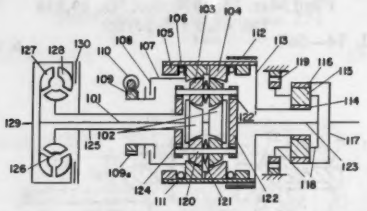
Helmut Körner, 12 Wichernstrasse, D–3340 Wolfenbuttel, Germany

Filed Mar. 30, 1970, Ser. No. 29,327
Claims priority, application Germany, Apr. 2, 1969, P 19 16 923.4
Int. Cl. F16h *1/16, 5/22, 37/06*
U.S. Cl. 74—665 GD **8 Claims**



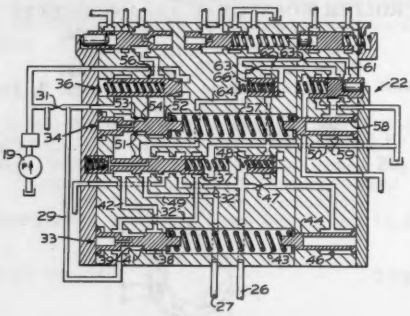
A roller worm gear arrangement is disclosed. The arrangement comprises a rotatable input shaft around the periphery of which a plurality of rotatable bodies are disposed in a carrier, the rotatable bodies are disposed at equal spacings and are in tangential contact with the periphery of the input shaft. The arrangement is provided with a plurality of co-axial output shafts, which are transversely orientated with respect to the input shaft and on each of which a respective helical gear wheel is mounted. Each helical gear wheel is mounted to rotate with the respective output shaft and is disposed in meshing relationship with the rotatable members carried on the carrier. The arrangement is such that in operation rotation of the input shaft causes the rotatable bodies to circulate in a planetary path thereby rotating each of the helical gear wheels and the respective output shafts.

3,618,423
TRANSMISSION
Walter V. Chery, 744 Alden St., Meadville, Pa. 16335
Continuation-in-part of applications Ser. No. 662,397, Aug. 22, 1967, and Ser. No. 727,937, May 9, 1968, now Patent No. 3,516,305. This application June 8, 1970, Ser. No. 44,570
Int. Cl. F16h *15/50, 47/08*
U.S. Cl. 74—688 22 Claims



A planetary friction type torque converter in combination with an overrunning clutch and a set of planetary gears. The combination results in a wide continuous multiplication of speed range between output and input.

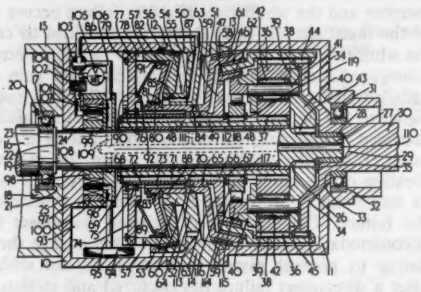
3,618,424
TRANSMISSION CONTROL SYSTEM
Kenneth F. Golan, Pekin, and Shairyl I. Pearce, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 2, 1969, Ser. No. 854,598
Int. Cl. B60k *33/00;* F16d *25/062;* F16h *57/10*
U.S. Cl. 74—753 4 Claims



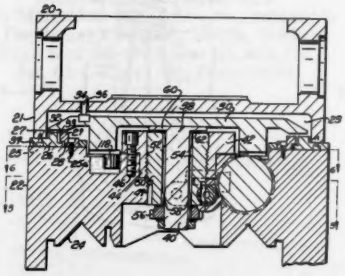
A planetary transmission having a series of fluid operated clutches and brakes, which are engaged and disengaged through a selector valve to change drive ratios, has means for modulating and sequencing the fluid pressures applied to the clutches and brakes to effect smooth shock free shifting. Basic control of the pressure at any of the clutches and brakes is effected by a single valve complex upstream from the selector valve while supplementary individual modulation means are provided downstream from the selector valve at one or more of the clutches or brakes to optimize performance during specific shifts.

3,618,425
CHANGE-SPEED GEARING
Axel Charles Wickman, 69 S. Washington Drive, St. Armands Key, Sarasota, Fla. 33577
Filed July 23, 1969, Ser. No. 843,972
Claims priority, application Great Britain, July 26, 1968, 35,754/68
Int. Cl. F16d *67/04;* F16h *5/18*
U.S. Cl. 74—781 5 Claims

A change-speed gearing suitable or automobiles or boats has a planetary gear train including a power input member, a power output member, and a reaction member. Two ratio selectors are provided for selecting planetary ratio by holding the reaction member against rotation and for selecting unit ratio by locking the reaction member to a rotary component of the gear train. The ratio selectors each include a pair of friction-engaging members with complementary friction-engaging surfaces. In at least one of the pairs of members the members are movable axially in opposite directions into operative and inoperative positions in which they engage and disengage with their respective friction-engaging surfaces. Axial bias means are provided for moving the pairs of members into the operative and inoperative positions.

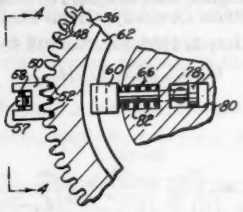


3,618,426
TURRET AND LOCKING MECHANISM
John Fisher, Aurora, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Oct. 21, 1969, Ser. No. 868,111
Int. Cl. B23b *29/32*
U.S. Cl. 74—824 20 Claims



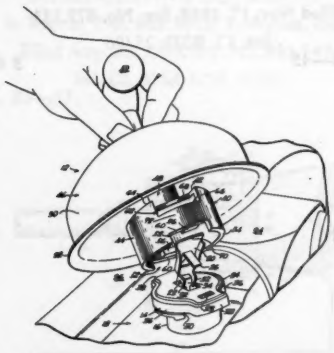
A machine tool includes a mechanism for locking an indexible turret in a predetermined position about an axis of rotation with respect to a slide. The mechanism includes first and second coupling members adjacently located and which are moved relatively upon indexing of the turret. A third coupling member is located adjacent the first and second coupling members and is operable to prevent relative movement of the first and second coupling members by simultaneously engaging the first and second coupling members to thereby simultaneously position and lock the turret. Rotation, release and locking of the turret is effected without axial movement of the turret.

3,618,427
LOCATING MEANS FOR INDEXING TABLE
Harry Schoepe, Cleveland, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Oct. 21, 1969, Ser. No. 868,112
Int. Cl. B23b *29/32*
U.S. Cl. 74—824 23 Claims



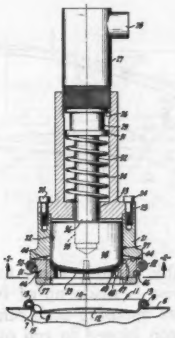
An improved mechanism for locating and locking a turret of a machine tool which is indexible about an axis of rotation with respect to a slide includes first and second toothed members located on the turret and slide respectively. Located adjacent the first and second toothed members is a third toothed member operable to engage with the first and second members to accurately locate the first toothed member with respect to the second toothed member to thereby accurately position the turret. A locking member is located adjacent the first and second toothed members and operable to engage with and lock the first and second toothed members against relative movement therebetween after the first and second members have been positioned by the third member to thereby lock the turret in position. Rotation, release, positioning and locking of the turret is effected without axial movement of the turret.

3,618,428
AUTOMOBILE RADIATOR CAP TOOL
Charles Dennis Phipps, 5990 SW. 111th St., Miami, Fla. 33143
Filed June 29, 1970, Ser. No. 50,830
Int. Cl. B25b *29/00*; B67b *7/44*
U.S. Cl. 81—3.1 R 7 Claims



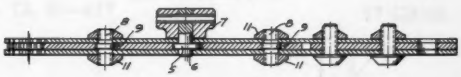
This disclosure concerns a small hand tool adapted for use in removing an automobile radiator cap and particularly for use in removing a cap from the radiator of an overheated automobile engine safely and without hazard of injury to the user by boiling hot fluids from the engine cooling system. The tool is provided with socket structure adapted to fit over the radiator cap and permit removal thereof, it includes a deep bowl-like shield having a rim portion flared downwardly over the socket structure for deflecting hot liquids from a radiator away from the user, and includes a T-shaped handle for manipulation of the tool.

3,618,429
DRUM CAP REMOVING TOOL
Joseph E. Froeliger, 1967 Gillchrist Ave., Stockton, Calif. 95205
Filed Sept. 3, 1969, Ser. No. 854,936
Int. Cl. B67b *7/00*
U.S. Cl. 81—3.2 5 Claims



A tool for removing a cap from a drum has a base with a central aperture along the axis of which a plunger is moved. From the sides of the plunger a plurality of jaws having sharp ends move radially outward to bite into the annular wall of the cap. A spring resists the jaw movement. The plunger end is a die to abut the central part of the cap and stretch and deform the cap material between the jaws and the plunger thus pulling the cap wall out from a retaining bead on the drum. The jaws can tip slightly for cap disengagement.

3,618,430
CYCLOIDAL WRENCH
Robert L. Wieck, Amarillo, Tex., assignor to Mason & Hanger-Silas Mason Co. Inc.
Filed July 17, 1970, Ser. No. 55,914
Int. Cl. B25b *17/00*
U.S. Cl. 81—57.3 3 Claims



A cycloidal wrench adapted to rotate a driven element in a given direction or in the reverse thereof, comprising two spaced and fixed reactive cam plates and between them an orbital cam drive plate to which orbital motion is imparted by an eccentric cam on a drive shaft projected through the reactive cam plates. The reactive cam plates are formed with tooth or "point" faced apertures aligned with a point faced aperture in the orbital cam drive plate. These apertures are adapted to receive the point carrying head of the said driven element, and the cam plates have at last one drive point more than those of the driven element head. Two or more restraining studs, passing through enlarged aperture in the orbital cam drive plate and carried by the fixed reactive cam plates, hold the orbital cam plate in parallel constraint while a relationship

is maintained such that the opposing drive points on both the orbital and reactive cam plates align with the apices of the driven element.

3,618,431

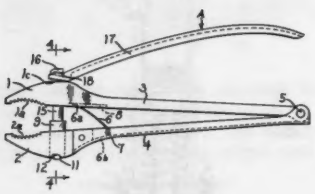
EASY GRIP TOOL

Raymond B. Nockleby, Rte. 1, Kalispell, Mont. 59901

Continuation-in-part of application Ser. No. 850,915, Aug. 18, 1969. This application June 25, 1970, Ser. No. 49,861

Int. Cl. B25b 7/04

U.S. Cl. 81—329 8 Claims



A hand tool usable to grip items firmly and further usable as a hand vise is made up of two gripping jaws having serrated faces opposing each other, the jaws having extensions thereon hinged to ech other at their ends remote from the jaws. The lower one of the jaws has a rectangular socket therein to receive an interiorly threaded sleeve which is pivoted to the lower jaw so that it can rock in the socket. A bolt with a rectangular head threads into the sleeve and extends through an aperture in the other jaw so that the rectangular head of the bolt is above that jaw. A handle fits on the bolt and has a rectangular seat therein to receive the bolt head and turn the bolt when the handle is turned. The jaws are urged apart by a known type of spring.

3,618,432

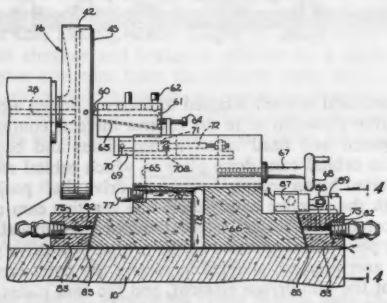
VIBRATION-FREE LATHE

Leonard A. Briese, Los Angeles, Calif., assignor to Wescal Industries, Inc., El Segundo, Calif.

Filed Mar. 17, 1969, Ser. No. 807,602

Int. Cl. B23b 3/00, 13/00

U.S. Cl. 82—2 12 Claims



A novel lathe construction enables a smooth, mirror-like surface to be machined by the lathe. The design is especially suited to products requiring an extremely smooth surface, for example memory discs for computers.

3,618,433

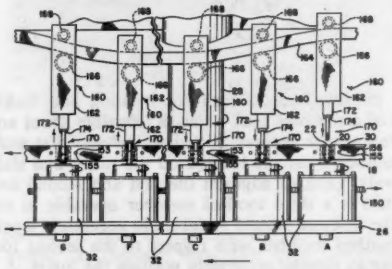
MACHINING APPARATUS AND SYSTEM

George Horst Reinemuth, Secane, Pa., and Mark Joseph Connor, Wilmington, Del., assignors to Gulf + Western Industrial Products Company, Grand Rapids, Mich.

Filed July 2, 1969, Ser. No. 838,605

Int. Cl. B23b 13/04

U.S. Cl. 82—2.7 14 Claims



An apparatus and system particularly suited for machining grooves in the outer surfaces of cylindrical workpieces. The apparatus disclosed includes a rotary turret on which is mounted a plurality of rotary cutting heads. The workpieces are fed to the turret by an endless flexible member provided with workpiece holders at spaced points therealong. The flexible member is trained about the turret at a location above the cutting heads and turret mounted rams function to move the workpieces into and out of the cutting heads during turret rotation.

3,618,434

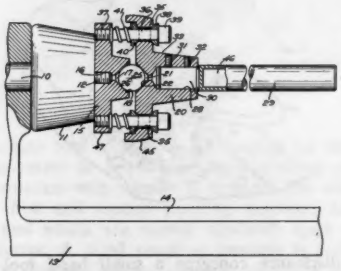
MACHINE ALIGNMENT BAR

Francis Gerard Nault, Warwick, R.I., assignor to Gentool Inc.

Filed Nov. 17, 1969, Ser. No. 877,211

Int. Cl. B23b 25/06

U.S. Cl. 82—45 5 Claims



An assembly for aligning the guiding surfaces of a machine with a rotatable member for alignment in two right-angular planes with respect to the axis of the rotatable member by means of a bar holder which is universally

mounted with respect to a base about a center between the holder and the base and with an arcuate surface on the bar holder whose center of radius is the center of point of swing between the holder and the base.

3,618,435

PROCESS AND DEVICE FOR THE RETARDATION OF WIRE CUTTINGS AFTER SAMPLING SHEARS

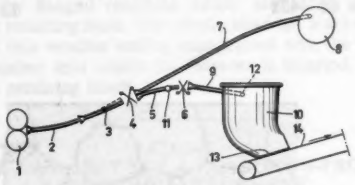
Karl Sten Olof Forsberg, Smedjebacken, and Hans Erik Gedin, Ludvika, Sweden, assignors to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Apr. 3, 1969, Ser. No. 813,067

Claims priority, application Sweden, Apr. 9, 1968, 4,763/68

Int. Cl. B26d 7/06

U.S. Cl. 83—27 6 Claims



This invention relates to a process and a device for the retardation of wire cuttings which move forward at high speed and come from the first and last end cut off from a hot wire rod from a rolling mill, the cut ends being cut off into short pieces in piece cutting shears ("toggle shears"). The pieces are guided tangentially into a cylindrical or slightly conical drum in such a way that the pieces cut off follow a spiral path along the inner jacket surface of drum until retardation has taken place when the pieces fall down to an opening at the bottom of the drum.

3,618,436

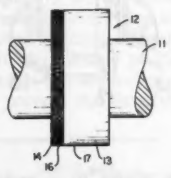
BRUSH SURFACED ANVIL FOR ROTARY SHEET-CUTTING EQUIPMENT

Donald A. Brown, P.O. Box 2042, Anderson, Ind. 46011

Filed Aug. 25, 1969, Ser. No. 852,743

Int. Cl. B26d 1/56, 7/20

U.S. Cl. 83—37 1 Claim



Linearly moving corrugated fiberboard sheet is supported on a rotating anvil using a polyurethane sleeve and a brush sleeve mounted side-by-side on the anvil shaft, the brush being of densely packed bristles to support the sheet directly behind the location of knives mounted on a rotating shaft and piercing the sheet, the brush accommodating entry of the knives into the brush during piercing without damage to either the knives or the brush, and serving as the exclusive support for the sheet at the knives.

3,618,437

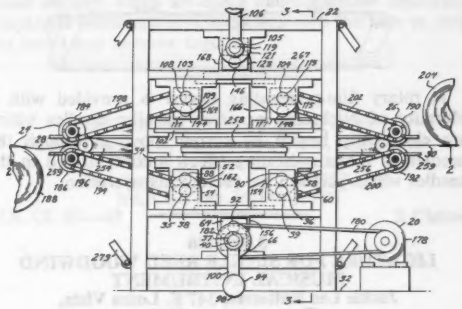
MACHINE FOR AND PROCESS OF DIE-CUTTING

Rene D. Colinet, 4902 N. 13th St. 19141, and William I. Bulmash, 6600 N. 11th St. 19126, both of Philadelphia, Pa.

Filed Sept. 8, 1969, Ser. No. 855,905

Int. Cl. B26d 1/56; B23d 25/10

U.S. Cl. 83—37 14 Claims



Die and backer, constantly facing each other, travel in circular paths which bring them close to each other with sheet material sandwiched between, all traveling at the same speed in the same direction, and then together to effect a contour cut. The two sides of the backer may be somewhat relatively dephased to produce a rocking component of motion and a rocking cut. Specific preferred structure includes shafts in sets of three and transmission of motion from below the sheet material to above it by pairs of lever arms attached to rollers in roller guides.

3,618,438

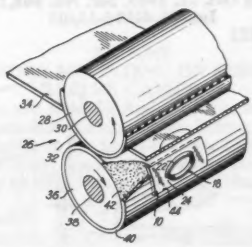
CUTTING

Walter A. Simson, New York, N.Y.
(230 Beverly Road, Scarsdale, N.Y. 10538)

Filed Nov. 6, 1968, Ser. No. 773,816

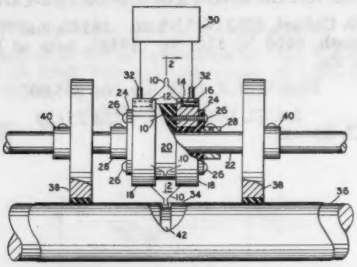
Int. Cl. B26d 1/56

U.S. Cl. 83—117 17 Claims



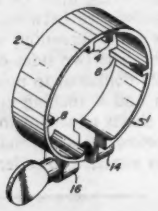
Cutting die comprising flat table cutting edge with curvilinear sides extending upwardly of a thin, flexible base and methods for producing and utilizing same.

3,618,439
FILM-PERFORATING DEVICE
Seymour Zelnick, Orange, N.J., assignor to Weldotron Corporation, Newark, N.J.
Filed June 1, 1970, Ser. No. 42,227
Int. Cl. B26d 7/10
U.S. Cl. 83—171 10 Claims



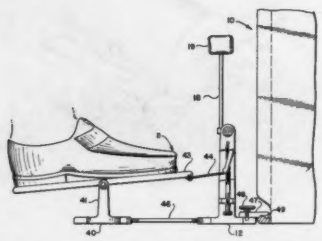
A rotary film-perforating device is provided with a plurality of Nichrome or other metallic needles which are electrically heated by current flowing through the needles so that the heating effect is concentrated in the needles which perform the perforating operation.

3,618,440
LIGATURE FOR SINGLE REED WOODWIND MUSICAL INSTRUMENT
Jackie Leo Ratterree, 347 E. Loma Vista, Tempe, Ariz. 85281
Filed Mar. 16, 1970, Ser. No. 19,934
Int. Cl. G10d 9/02
U.S. Cl. 84—383 1 Claim



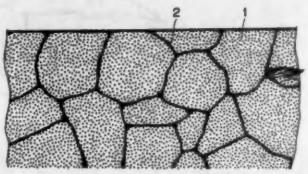
An improved ligature is disclosed which is spaced from both mouthpiece and reed to permit freer vibration of both mouthpiece and reed resulting in richer, darker, mellower tones and more even tones throughout the various registers of the instrument.

3,618,441
DOUBLE ACTING DRUM PEDAL
John A. Fearns, 42 Hickory St., Norwich, Conn. 06851
Filed Oct. 21, 1969, Ser. No. 868,121
Int. Cl. G10d 13/00
U.S. Cl. 84—422 5 Claims



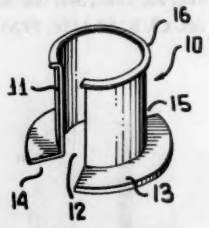
A double acting bass drum pedal has a beater mounted on a horizontal shaft with there being an arm also mounted on said shaft but offset from the rotary axis thereof and directed downwardly toward an end of a rockably mounted pedal. A flexible strip connects the arm to the end of the pedal so that rocking of the pedal in either direction will rotate the shaft in one direction to bring the beater into the drum beating position.

3,618,442
VIBRATING PLATES FOR SOUND INSTRUMENTS AND METHOD OF MANUFACTURING THE SAME
Genichi Kawakami, Hamakita-shi, Japan, assignor to Nippon Kakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Continuation-in-part of application Ser. No. 580,803, Sept. 20, 1966. This application Oct. 13, 1969, Ser. No. 866,027
Claims priority, application Japan, Sept. 25, 1965, 40/58,570
Int. Cl. C08j 1/14; G10d 15/00
U.S. Cl. 84—452 15 Claims



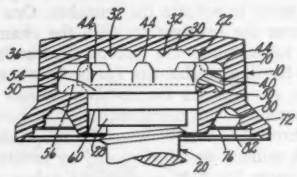
A vibrating plate for sound instruments comprising a plurality of foamed granules of a thermoplastic resin and a boundary layer of a thermosetting resin adhering said foamed granules together to form an integral structure.

3,618,443
SNAP-IN GASKET HOLDER
Donald F. Fitzner, 6361 Isleta Blvd. SW., Albuquerque, N. Mex. 87105
Filed July 15, 1969, Ser. No. 841,874
Int. Cl. F16b 19/00
U.S. Cl. 85—5 1 Claim



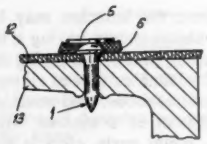
This disclosure relates to a gasket holder which is useable to hold a gasket in place relative to a machine element by being passed through a bolt receiving opening in the gasket and being snapped into the internally threaded bore into which the bolt is to be threaded. A principal feature of the holder is the resilient construction thereof which permits it to be readily snapped into place and wherein, when released, it will retain its position. A further feature of the holder is the useability of a single holder for several sizes of bolts.

3,618,444
CORROSION RESISTANT FASTENERS
Wilfred Kay, West Caldwell, and Louis Oestereicher, Teaneck, N.J., assignors to USM Corporation, Boston, Mass.
Filed May 16, 1969, Ser. No. 825,335
Int. Cl. F16b *23/00*
U.S. Cl. 85—9 4 Claims



A corrosion resistant fastener comprising a metallic portion having a threaded shaft and a retaining head. A plastic head is retained securely in position on the metallic portion by flanged retaining means associated with the metallic retaining head. The plastic head has a skirt which is urged into weather sealing engagement with the surface of a member into which the fastener is inserted, by the metallic retaining head.

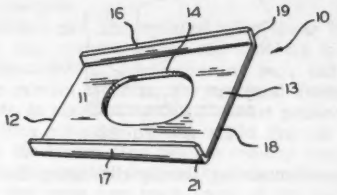
3,618,445
NAIL ASSEMBLY FOR A CORROSION-PROOF FASTENING ATTACHMENT
Manfred Hartmann, Frastanz, and Kurt Schmid, Altenstadt, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Sept. 10, 1969, Ser. No. 856,615
Claims priority, application Germany, Sept. 17, 1968, P 17 75 730.1
Int. Cl. F16b *15/02*
U.S. Cl. 85—10 E 4 Claims



A nail assembly is formed of an axially extending shank with a driving point at one end and a head extending transversely from the shank at the other, a plastically deformable washer fitted on the shank, and a metallic plate member integrally secured to and extending laterally from the nail head. The nail assembly is used in fastening material in a corrosion-proof manner, such as wall or roof coverings, which is secured to a hard structural material and where the nail assembly is inserted by means of an explosive driven setting tool. When inserted the plate member forces the washer against the material being secured forming a seal for the opening made by the nail. In the inserted position only the plate member and the washer are exposed and they are formed of materials which prevent the development of any corrosion.

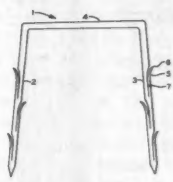
3,618,446
WOOD FASTENERS
Hugh Black, Downers Grove, Ill. (Liner Cove Road, P.O. Box 556, Waynesville, N.C. 28786)
Continuation-in-part of application Ser. No. 756,844, Sept. 3, 1968. This application Feb. 26, 1970, Ser. No. 14,561
Int. Cl. F16b *15/00*
U.S. Cl. 85—11 2 Claims

Wood fasteners having body sections comprising converging peripheral resilient side walls. The body section includes an elongated hole therein. The elongated hole provides maintaining means for retaining the fasteners on a carrier. The hole further provides expansion space



for wood displaced as the fastener is driven into abutting wood sections which are being joined together therewith. Displaced wood acts in conjunction with the hole to lock the wood and fastener together.

3,618,447
DETERIORATION FASTENERS
Robert R. Goins, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Sept. 15, 1969, Ser. No. 857,681
Int. Cl. F16b *15/00, 15/06*
U.S. Cl. 85—49 2 Claims



Fastening apparatus are disclosed which embody one or more legs having upwardly and outwardly projecting barbs which provide resistance to withdrawal after insertion in the material to be fastened. By fabricating the fasteners from polymeric materials which undergo decomposition in ultraviolet light, the fasteners have a predictable life.

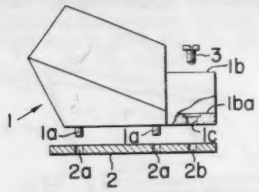
3,618,448
HIGH EXPLOSIVE CARTRIDGE
Robert W. Heinemann, Rockaway Township, N.J. (147 Elm St., Dover, N.J. 07801)
No Drawing. Filed June 9, 1969, Ser. No. 831,765
Int. Cl. C06d *1/08;* F42d *1/08, 5/00*
U.S. Cl. 86—20 7 Claims

A process for the low pressure deposition of high explosive charges in specific configurations under actual warfare conditions in the field.

3,618,449
VIEWFINDER MOUNTING ON SINGLE-LENS REFLEX CAMERAS
Kenji Hiruma and Sadanao Ando, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Sept. 23, 1969, Ser. No. 860,234
Claims priority, application Japan, Oct. 3, 1968, 43/86,407; Dec. 6, 1968, 43/106,339
Int. Cl. G03b *13/02*
U.S. Cl. 88—1.5 4 Claims

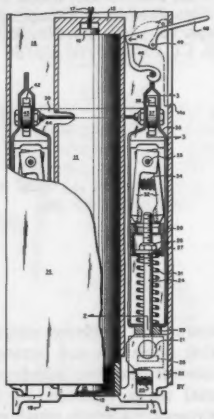
A viewfinder for single-lens reflex cameras upon which a penta-roof type reflecting mirror may be mounted through a mounting member without providing edges along the side walls of the mirror for mounting. The main body of the mirror may be correctly positioned relative to the camera body and the mirror is securely held in posi-

tion at the portions exterior of the main body of the mirror so that no force is directly applied to the reflecting



mirror upon mounting, thereby eliminating the distortion thereof.

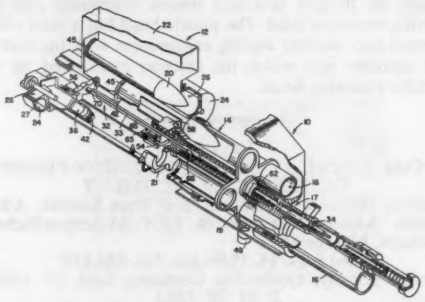
3,618,450
TAKE-UP LATCH MECHANISM
Henry Fink, Jr., Torrance, and Curtis B. Anderson, Mission Viejo, Calif., assignors to the United States of America as represented by the Secretary of the Navy
Filed Feb. 26, 1970, Ser. No. 14,374
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 R **6 Claims**



A latch mechanism for positively securing a sonobuoy launching container inserted generally upward in an aircraft-mounted lanucher tube. A pair of latches at opposite sides of the tube opening are spring-urged inwardly to engage the exposed end of the container when inserted. Each latch is connected to one end of a rod, the other end being threaded for selective engagement by a correspondingly threaded collet pivotally connected to launcher tube structure. A collet ring, movable along the length of the rod by a stirrup, is drawn upward urging the collet into locking engagement with the rod. The stirrup is spring-biased downward and is urged upward by a manually-operated lever. Thus, the container is first drawn into the tube to a predetermined force, then the collet ring engages the collet causing it to grip the rod and positively secure the container.

3,618,451
LOADER MECHANISM FOR AN AUTOMATIC ROCKET LAUNCHER
Arthur A. Smith, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed Nov. 3, 1969, Ser. No. 873,338
Int. Cl. F41f *3/04, 9/00*
U.S. Cl. 89—1.804 **7 Claims**

A loader mechanism for loading a plurality of rockets into an open breech high rate automatic launcher while simultaneously launching a second plurality of rockets. The launcher is an automatic high rate, open breech launcher fed by a four cylinder revolver which generates rotary reciprocating motion. The loader mechanism loads a pair of rockets in a pair of the cylinders of the revolver while a second pair of rockets are fired from a second pair of cylinders of the revolver. Two rounds are loaded and two rounds are fired each half cycle. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chambers with the launch tubes while the second hydraulic cylinder actuates the loading mechanism for performing the loading function, reciprocates the revolver to seal and align the firing chambers with the launching tubes, retracts the revolver to break the seal between the tubes and revolver chambers. A pulsing switch operated by revolver motion serves to actuate the pair of solenoid valves to actuate the hydraulic cylinders.



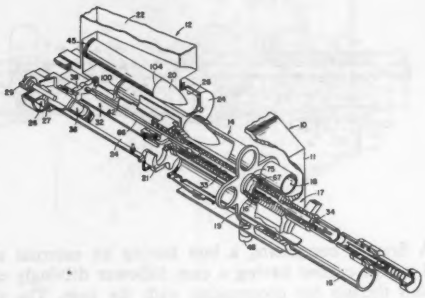
The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.) is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,618,452
OBTURATING MECHANISM FOR AN AUTOMATIC ROCKET LAUNCHER
Arthur A. Smith, Peter L. Green, and Corbet M. Cornelison, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed Nov. 3, 1969, Ser. No. 873,417
Int. Cl. F41f *3/04, 9/00*
U.S. Cl. 89—1.804 **7 Claims**

A rocket launcher having a four barrel revolver from which a pair of rockets are fired while, simultaneously, a second pair is loaded therein in launching position. Mechanism is provided for obturating and deobturating the four barrel revolver into two launcher tubes to accomplish sealing between two of the revolver cylinders and the two launch tubes.

The launcher is an automatic high rate, open breech, dual tube launcher fed by a four cylinder revolver which generates rotary reciprocating motion. Two rounds are loaded and two rounds are fired each half cycle. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chamber

with the launching tubes while the second hydraulic cylinder performs the loading operation, reciprocates the revolver into obturating position to seal and align the firing chambers with the launching tubes, and retracts to clear the seals and latch the rounds being loaded into the revolver chamber. A pulsing switch operated by revolver motion serves to actuate the hydraulic cylinders.

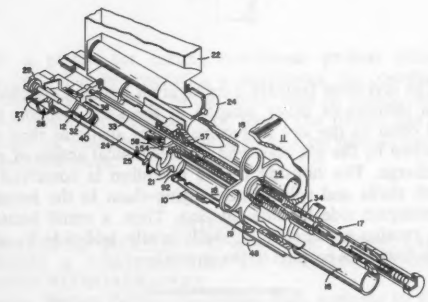


The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.) is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,618,453
OPEN BREECH HIGH RATE AUTOMATIC ROCKET LAUNCHER

Corbet M. Cornelison, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1969, Ser. No. 873,418
Int. Cl. F41f *3/04, 9/00*
U.S. Cl. 89—1.804 **7 Claims**



An open breech, high rate, automatic, rocket launcher provided with a pair of launching tubes and a four chamber revolving and reciprocating revolver. The revolution of the revolver allows two chambers to be aligned with the launching tubes while the other two chambers are being loaded. The reciprocating motion of the revolver allows it to move forward to seal and align the firing chambers with the launching tubes, then to move back to clear the seals and latch the rounds being loaded into the loading chambers. The revolver is then free to rotate 90° to repeat the cycle.

The motions are accomplished using linear hydraulic actuators with variable orifice end snubbers to control the acceleration and deceleration at each end of the strokes to prevent exceeding the structural limitations of the rockets, to maintain control of rocket position and to limit exciting vibrations which would degrade the accuracy of the launch. The rotation cylinder controls the angular position of the revolver by means of a modified 90° half sine wave cam track (peak of the sine wave) mounted on the revolver assembly. The linear stroke of the hydraulic cylinder is thus converted to a 90° of rotating motion of the revolver. The same 90° arc being used clockwise then counter-clockwise for each succeeding cycle of the launcher's operation.

A ram-retract cylinder located on the center line of the revolver controls the loading of the new rounds, moving the revolver forward to seal with the launch tubes at the beginning of the ram stroke and releasing the revolver to spring back from the seals at the end of the stroke, and depressing a plurality of firing switches in sequence to obtain the maximum firing interval possible while the chambers are sealed to the launching tubes.

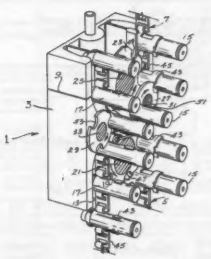
The return or retract stroke is rapidly accomplished to provide time for the loader assembly located on its extreme rear to properly engage the new rounds for the next cycle and to prevent jamming of the mechanism.

The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.) is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,618,454
TWO-DIRECTION AMMUNITION TRANSFER MECHANISM

James R. Christenson, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 30, 1969, Ser. No. 862,377
Int. Cl. F41d *9/00*
U.S. Cl. 89—33 BB **8 Claims**



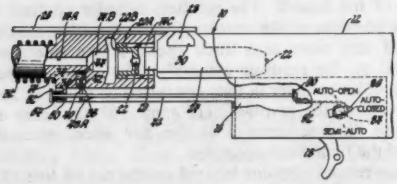
In a linkless, flexible armament system having a conveyor for transporting live rounds from an ammunition magazine to a gun and spent cartridge cases and dud rounds from the gun to a storage container, a mechanism is provided for permitting ready separation of the conveyor loop into two halves without physically disconnecting or breaking the conveyor chain.

3,618,455

MANUAL OPEN- AND CLOSED-BOLT WEAPON FIRE CONTROL WITH AUTOMATIC HEAT RESPONSIVE OVERRIDE

Roy D. Plumer, Santa Barbara, and Harold Shrout, Goleta, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed July 25, 1969, Ser. No. 844,926
Int. Cl. F41d *11/02, 11/20*
U.S. Cl. 89—132 3 Claims



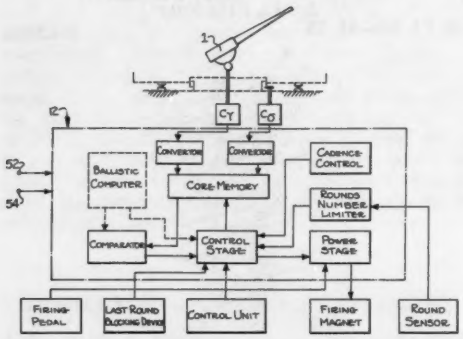
A fire control system for an automatic firearm capable of being manually set to selectively provide automatic closed-bolt operation, automatic open-bolt operation and semiautomatic closed-bolt operation. The firearm can be set to these modes of operation by moving a mode-selector knob located on the exterior of the firearm. The knob moves a cam which cooperates with sear parts to set the mode of operation. A heat sensing device is positioned in the barrel of the firearm near the firing chamber to sense the temperature of the barrel and when this temperature reaches a point at which cook-off of a cartridge is incipient a mechanism is actuated to automatically switch the firearm to its automatic open-bolt mode of operation. The firearm is capable of firing caseless ammunition.

3,618,456

FIRING ZONE LIMITING APPARATUS

Gunter Mindel, Dusseldorf, Germany, assignor to Rheinmetall G.m.b.H., Dusseldorf, Germany

Filed Sept. 2, 1969, Ser. No. 854,545
Claims priority, application Germany, Sept. 12, 1968, P 17 28 222.3
Int. Cl. F41d *11/02*
U.S. Cl. 89—134 7 Claims



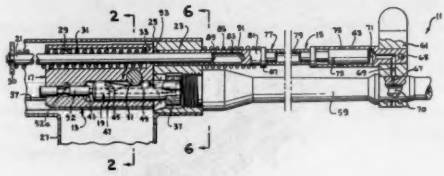
A firing zone limiting apparatus for a laterally and vertically adjustable weapon which is provided with lateral angle and elevation angle coders by means of which the contours of blocked areas can be fed into a store of an electronic control system which controlls the action of the firing magnet of the weapon.

3,618,457

ROTARY AND SLIDING FIREARM BOLT WITH ETERNAL CAM

Arthur Miller, 1602 Myrtlewood, Costa Mesa, Calif. 92626

Filed Nov. 25, 1969, Ser. No. 879,848
Int. Cl. F41d *5/06*
U.S. Cl. 89—185 17 Claims



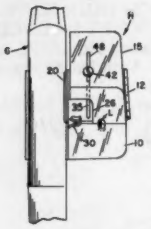
A firearm comprising a bolt having an external cam and a bolt carrier having a cam follower drivingly connected thereto for cooperating with the cam. The cam follower is mounted for rotation relative to the bolt carrier so that it can roll along the external cam. The firearm may also include a push rod assembly includnig a push rod and a guide rod having end portions mounted in slidable, telescoping relationship.

3,618,458

SHELL RETRIEVER DEVICE FOR SHOTGUNS

Gene M. Pruonto, 124 E. 1st Ave., and Robert G. Cummings, 233 E. Crawford Ave., both of Altoona, Pa. 16602

Filed July 15, 1969, Ser. No. 841,720
Int. Cl. F41c *21/00*
U.S. Cl. 89—33 SF 9 Claims



The invention features a transparent housing attachable to a shotgun or other weapon at the shell ejection slot and open to the slot to receive empty shells as they are expelled by the gas blast and by mechanical action of gun discharge. The housing of the invention is contrived to catch shells and spin them, lodging them in the housing in compact side by side relation. Thus, a small housing can receive a plurality of shells neatly laid side by side with their axes parallel to the gun axis.

3,618,459

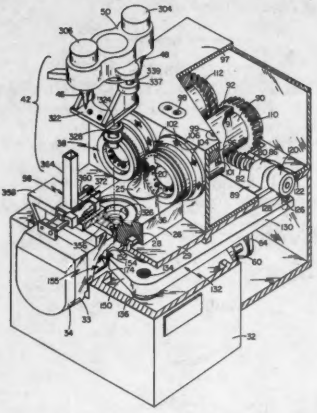
GEAR MAKING

Alexander D. F. Moncrieff, Marion, Mass., assignor to Bird Island, Inc., Boston, Mass.

Filed Aug. 8, 1969, Ser. No. 848,599
Int. Cl. B23f *23/04*
U.S. Cl. 90—1 10 Claims

Loading and unloading workpieces in gear making apparatus having workpiece support adjacent a cutter, with a pair of workpiece holders mounted on a carrier for

oscillation with respect to the support and further with respect to a workpiece supply station, the carrier inter-



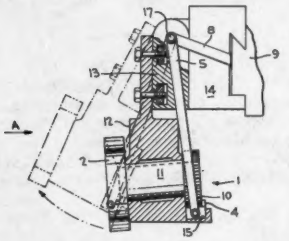
mittently undergoing rotation about and movement along its own axis.

3,618,460

DEVICE FOR MACHINING SURFACES OF ARTICLES WITH ROTATING CUTTING TOOL

Veniamin Markovich Braslavsky, Ulitsa Michurina 40, kv. 14, Sverdlovsk, U.S.S.R.

Filed Mar. 26, 1969, Ser. No. 810,730
Int. Cl. B23d *13/02*
U.S. Cl. 90—54 3 Claims



In a planer for cutting curvilinear profiles with a rotating cutter incorporating a mechanism for coordinating the angular motion of the cutter with its translational movement in the direction of feed. The device can be utilized for machining the surfaces of a curvilinear profile on machine tools.

3,618,461

PROCESS OF MACHINING A METAL IN CONTACT WITH A COMPOSITION OF CHLOROFLUORO- AND NITROALKANES

Murray Borton Parker, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1970, Ser. No. 1,812
Int. Cl. B23c *1/00*
U.S. Cl. 90—11 C 6 Claims

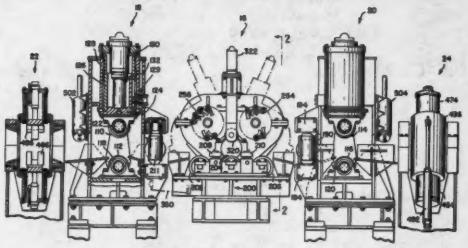
The process of machining a metal in contact with a cutting fluid comprising trichlorofluoromethane or 1,1,2-trichloro-1,2,2-trifluoroethane and from about 0.5 percent to 15 percent by weight of a nitroalkane having 1 or 2 carbon atoms.

3,618,462

BILLET CHIPPER

Werner W. Eibe and Richard W. Tepel, Pittsburgh, Pa., assignors to Blaw-Knox Company, Pittsburgh, Pa.

Original application June 14, 1968, Ser. No. 737,042, now Patent No. 3,496,831, dated Feb. 24, 1970. Divided and this application Dec. 4, 1969, Ser. No. 882,264
Int. Cl. B23c *3/00*
U.S. Cl. 90—11 R 6 Claims



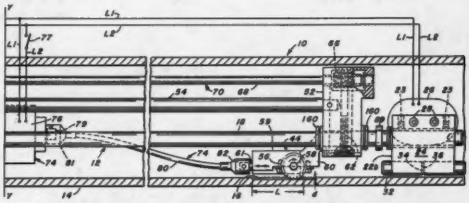
A billet chipper having a pair of rotating cutting heads arranged to be selectively moved into a working position for removing defects from a billet moved past a chipping station. One of the cutting heads is adapted to remove defects from the billet as the billet is moved in one direction past the chipping station and the other of the cutting heads is adapted to remove defects from the billet as it is moved in the opposite direction past the chipping station. The billet chipper is also provided with mechanism for clamping the billet securely during chipping so as to prevent vibration thereof as a result of the forces developed by the cutting heads.

3,618,463

NOTCHING APPARATUS

Wayne L. Briney, North Irwin, and William L. Zemberry, Swissvale, Pa., assignors to United States Steel Corporation

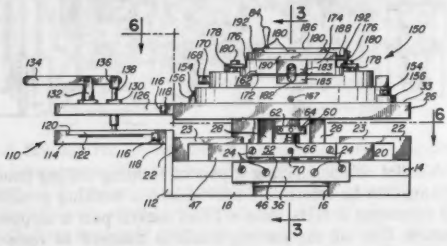
Filed Oct. 3, 1969, Ser. No. 863,559
Int. Cl. B23c *1/20, 3/30*
U.S. Cl. 90—12 22 Claims



This invention relates to notching apparatus for forming reference standard notches in workpieces for use as a reference standard in the inspection of metal products, such as pipe, bar, plate and the like, for internal discontinuities therein by ultrasonic eddy current, fringe flux systems, and the like. The notching apparatus for forming a reference notch of predetermined depth in a workpiece has a base frame positioned in a notch forming position with respect to the workpiece preparatory for the forming of the notch. A slide frame is reciprocable on the base frame and magnetic gripping means are on the base frame and are engageable with the workpiece to secure the apparatus with respect to the workpiece in the notch forming position. Notching means are reciprocable on the slide frame toward and

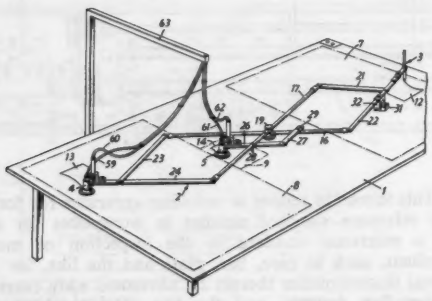
away from the workpiece. Drive means are on the slide frame, are connected to the notching means and are utilized for causing cutting movement of the notching means. Reciprocating drive means on the slide frame are connected to th notching means and cause the notching means to cut the notch to the predetermined depth.

3,618,464
DUPLICATOR
Roger J. Michaud, Sr., Garden Apartments, Apt. 22–D, Manchester, Conn. 06040
Filed Dec. 4, 1969, Ser. No. 881,992
Int. Cl. B23d *1/08;* **B23b** *39/06*
U.S. Cl. 90—13 R **15 Claims**



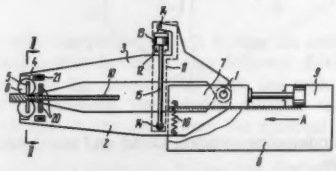
Apparatus for pattern copying utilizes a template mounted within a base under a carrier which is movable thereover. The carrier, which has a stylus projecting downwardly into the template, may support a workpiece on its upper surface, and it is restricted against angular and axial movement relative to the base. Both the template and the stylus may be mounted in removable drawers, and the machine may include drilling and universal assemblies, the latter of which permits adjustment of the lateral and angular position of the workpiece mounted upon the carrier.

3,618,465
CUTTING DEVICE
Michel Brochard, 14 Rue des Reculettes, 75 Paris XIII, France
Filed Feb. 10, 1970, Ser. No. 10,141
Int. Cl. B23c *1/16;* **B43l** *13/10*
U.S. Cl. 90—13.1 **6 Claims**



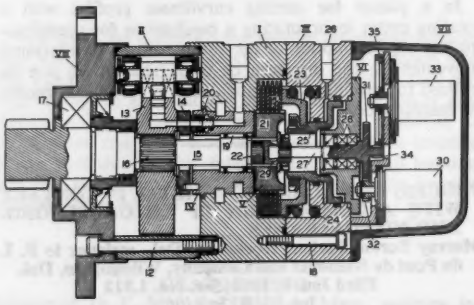
Apparatus for cutting out sheet material has a follower member for following curves and patterns of the shape to be cut, a principal cutter member positioned to move in a first cutting zone, coupling means linking the principal cutter member to the follower member such that the principal cutter member is constrained to reproduce a shape followed by the follower member, and an auxiliary cutter member positioned to move in a second cutting zone distinct from the first cutting zone, the auxiliary cutter member being controlled by the coupling means such that it is constrained to describe a shape which is similar to the shape described by the principal cutter member, but on a reduced scale.

3,618,466
DEVICE FOR ELIMINATING FLASH FROM WELD SEAMS OF BUTT-JOINTED STRIPS IN A BUTT WELDER
Jury Mikhailovich Nedodaev, Rogozhskyval 15, kv. 23; Boris Adolfovich Ryss, M. Kolkhoznaya ploschad 1, kv. 138; and Samuil Grigorievich Molchadsky, N. Cheremushkinskaya ulitsa 50, korpus 1, kv. 23, all of Moscow, U.S.S.R.
Filed Mar. 16, 1970, Ser. No. 19,843
Int. Cl. B23d *1/14*
U.S. Cl. 90—24 F **3 Claims**



A device for eliminating flash from the weld seams of metal strips in a butt welding machine, wherein provision is made for pivotable levers mounted on a common pivot pin and adapted to conjointly turn in a vertical plane, the vacant ends of said levers carrying cutting tools arranged one above the other, the strip being cleaned passing therebetween; and supporting rollers mounted on both sides of the cutting tools and adapted to be in constant contact with the surface of the strip under treatment, the line of contact of said rollers lying on the same straight line as the cutting edge of the tool.

3,618,467
HYDRAULIC MOTOR UNIT ARRANGEMENT
Jacques Faisandier, Chatillon-sous-Bagneux, France, assignor to Societe d'Applications des Machines Motrices S.A., Issy les Moulineaux, France
Filed June 3, 1969, Ser. No. 829,969
Claims priority, application France, June 6, 1968, 153,966
Int. Cl. F01b *25/04;* **F16d** *25/00*
U.S. Cl. 91—1 **8 Claims**

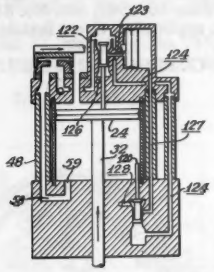


A hydraulic motor unit constituted by the assembly of three main sub-units connected by generally plane faces. The central sub-unit containing the rotor is disposed between the disc-brake sub-unit and the sub-unit containing the non rotary parts of the supply and exhaust system.

3,618,468
RECIPROCATING AIR MOTOR EXHAUST ASSEMBLY

Richard K. Gardner, Montpelier, and Wilbert G. Kautz, West Unity, Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed June 24, 1969, Ser. No. 836,037
Int. Cl. F01l *25/06*
U.S. Cl. 91—306 2 Claims

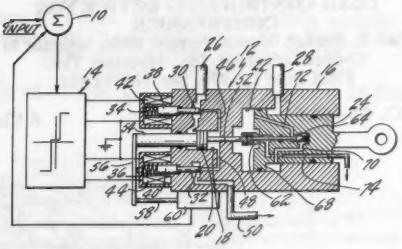


A reciprocating piston air motor with a pilot piston operated slide valve that admits air alternately to opposite ends of the drive cylinder of the air motor through separate straight air passages which also serve as exhaust passages. The position of the drive piston is sensed by stems extending from spool valves positioned at opposite ends of the drive piston cylinder chamber. The spool valves control the supply and exhaust to the pilot piston, thereby controlling the slide valve and consequently pressure to the drive piston.

3,618,469
SOLENOID OPERATED ACTUATOR SYSTEM

Donald F. Wills, Suffield, and Ronald E. Falk, Bristol, Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Sept. 19, 1968, Ser. No. 760,817
Int. Cl. F15b *13/16, 15/17*
U.S. Cl. 91—361 19 Claims

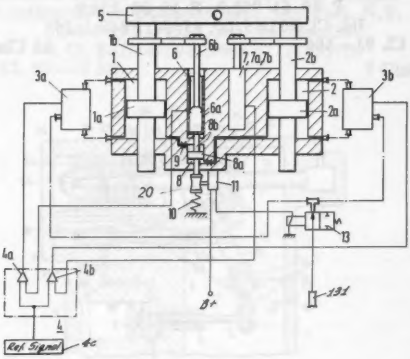


A stable, proportional control system having an actuator characterized by a first stage comprising an integrating pilot piston, the flow of operating fluid to the pilot piston chamber being controlled by opposed solenoid operated valves. The solenoid operated valves are responsive to amplifying and switching circuitry having an accurately controlled deadband, the switching circuitry being responsive to command signals and pilot piston position feedback signal. The pilot piston, via a suitable linkage, controls the operation of valves which control the delivery of operating fluid to a second stage in which is disposed a load connected, differential area slave piston.

3,618,470
DEVICE FOR SUPERVISING ELECTRO-HYDRAULIC ACTUATORS

Alfred Mueller, Bremen, Hans-Joachim Stemmildt, Neerstedt, and Eckhard Renner, Achim, Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH

Filed June 10, 1970, Ser. No. 45,155
Claims priority, application Germany, June 25, 1969, P 19 32 066.2
Int. Cl. F15b *11/22*
U.S. Cl. 91—411 R 12 Claims

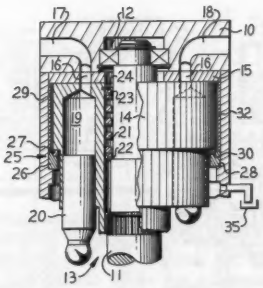


A dual cylinder drive with pistons operating a common output actuator and individual feedback control in follower operation as to an electrical input. Any pressure differential between the cylinders is used to generate a control operation tending to equalize the pressure for similar relative piston positions. In case of excess pressure difference, the drive is shut down.

3,618,471
HYDRODYNAMIC THRUST BEARING FOR AXIAL PISTON-TYPE PUMP OR MOTOR

Allyn J. Hein and Gilbert Tribley, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

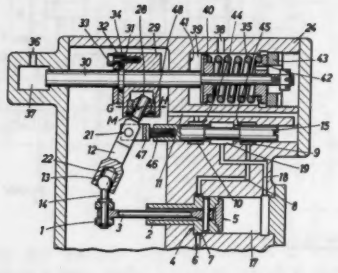
Filed Aug. 21, 1969, Ser. No. 851,896
Int. Cl. F04b *1/20*
U.S. Cl. 91—485 8 Claims



An axial piston-type pump or motor has a hydrodynamic thrust bearing arrangement disposed between the housing and cylinder barrel thereof. Such bearing arrangement comprises a bearing holder and a bearing ring mounted in circumferential counterbores formed in the housing and bearing holder, respectively. A cylindrical spacer sleeve is disposed between the bearing holder and a port plate to aid in positively maintaining the integrated

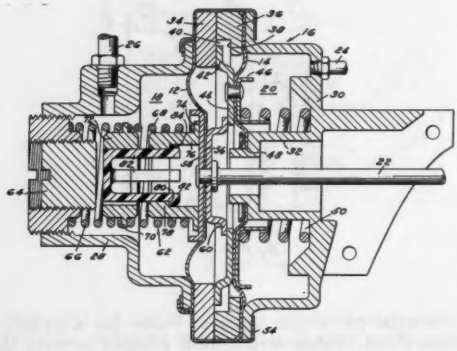
structures in their correct positions. A fluid passage is defined between the spacer sleeve and the cylinder barrel to communicate lubricating fluid to the thrust bearing.

3,618,472
DEVICE FOR ADJUSTING THE STROKE VOLUME IN A SWASH PLATE, AXIAL PISTON MOTOR OR PUMP
Hans Knaak, Rheydt, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchen-Gladbach, Germany
Filed Feb. 9, 1970, Ser. No. 9,641
Claims priority, application Germany, Dec. 5, 1969, P 19 61 908.0, P 19 08 234.9
Int. Cl. F01b *3/00, 13/04;* F04b *1/26*
U.S. Cl. 91—506 11 Claims



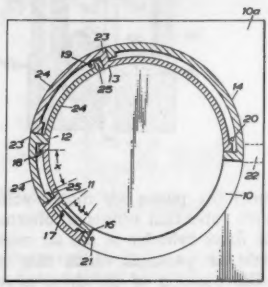
The tilting angle of a swash plate in a fluid pump or motor is adjusted by a piston articulated to the plate and position controlled by a servo valve which, in turn, is operated by a plunger coupled to the swash plate by a single control lever. The connecting lever is connected to swash plate and plunger so that one of the connecting points can undergo three dimensional motion in relation to the respective other one.

3,618,473
MULTISTAGE DIAPHRAGM VACUUM SERVO
Gerald R. Miller, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Feb. 2, 1970, Ser. No. 7,490
Int. Cl. F01b *19/02*
U.S. Cl. 92—48 2 Claims



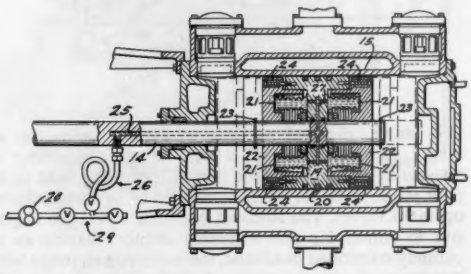
A housing contains two axially spaced vacuum actuated flexible diaphragms each spring biased towards the other and controlling movement of a force transmitter secured to one of the diaphragms, the spring assembly biasing the one diaphragm including two springs of different preloads and a spring retainer that is located between the two springs and of a construction providing two stage operational movement of the one diaphragm in one direction in response to vacuum changes.

3,618,474
MULTIPLE PISTON INCREMENTAL RAMS
Richard Ward, Worsley, England, assignor to Wm. Park & Co. Forgemasters Limited, Wigan, England
Filed June 10, 1969, Ser. No. 831,960
Claims priority, application Great Britain, June 14, 1968, 2,866/68
Int. Cl. F01b *31/12;* F15b *11/18*
U.S. Cl. 92—5 12 Claims



A multiple piston incremental ram as used for machine tool positioning or a digital to analogue converter is characterised in that the pistons work in an arcuate chamber. The pistons are of S or Z shape so that they hook on one another in an interconnected series and conveniently have a central part which seals slidingly on the walls of the chamber. The chamber can be annular or helical and the output can be visual or mechanical. Actuating ports are provided between the various central parts and a resetting port is also provided. Conveniently the chamber and pistons are both of plastics material the pistons being formed of a thermally softening plastics material strip.

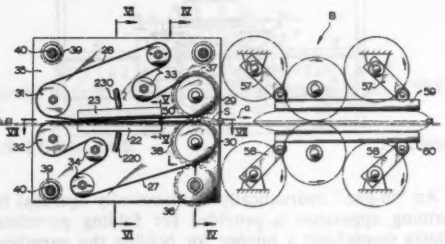
3,618,475
LOAD CONTROLLING DEVICE FOR COMPRESSORS
Earl R. Sauder, Mount Vernon, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed June 1, 1970, Ser. No. 41,881
Int. Cl. F01b *31/14*
U.S. Cl. 92—60.5 5 Claims



The invention is a fluid compressor load controlling device having an expandable piston within a cylinder. A collapsible bellows in communication with a pressurized

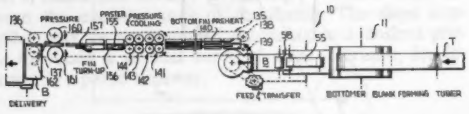
fluid source varies in volume with the amount of fluid present in the bellows. This correspondingly varies the size of said piston and inversely the volume of said cylinder thereby varying the compression load on the fluid compressor.

3,618,476
APPARATUS FOR OPENING FLATTENED TUBES OF FLEXIBLE SHEET MATERIAL
Fritz Achelpohl, Wulfekuhle, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany
Filed Aug. 27, 1968, Ser. No. 755,707
Claims priority, application Germany, Sept. 1, 1967, P 16 11 701.4
Int. Cl. B31b *1/00*
U.S. Cl. 93—8 **3 Claims**



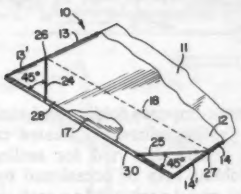
The superimposed layers of the ends of flattened flexible tubes used in bag making are first separated gradually by suction means operating on the opposite sides of the folded tubes adjacent the ends thereof and are thereafter opened rapidly. The suction means comprise either suction tables which can be moved apart during stationary periods in step-conveyance of the tubes, or where the tubes are conveyed continuously, counter-rotating suction rollers or belts. After initial separation of the layers the tubes are passed to a subsequent station where the ends are rapidly opened completely.

3,618,477
METHOD OF AND APPARATUS FOR MANUFACTURING BAGS
Thomas E. Piazze, Mount Vernon, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 22, 1970, Ser. No. 30,710
Int. Cl. B31b *49/04*
U.S. Cl. 93—35 SB **25 Claims**



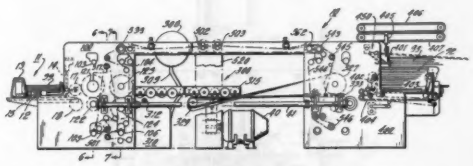
This disclosure relates to a process of and apparatus for manufacturing bags of the type having a gusseted body and a bottom which includes a pair of bottom panels and a fin transverse thereto by conveying each bag along a linear first path with its bottom leading and its fin in an upstanding position, transferring the bag to a second conveyor by rotating the bag at least ninety degrees and while being conveyed along a second path subjecting the fin, whose inner surfaces carry heat-activatable adhesive, to an elevated temperature sufficient to render the adhesive tacky and flowable, and thereafter subjecting the fin to regulated pressure along a predetermined area as the temperature decreases to bring the inner surfaces of the fin into intimate contact whereby the still flowable adhesive fills pinholes and the like prior to the setting of the adhesive. Thereafter grooved chill rolls cool the adhesive to its setting temperature during which period the fin is continually subjected to regulated pressure until the adhesive has set.

3,618,478
THREE DIMENSIONAL BAG WITH REINFORCED BOTTOM AND METHOD OF FORMING SAME
Thomas E. Piazze, Mount Vernon, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.
Filed July 31, 1969, Ser. No. 846,536
Int. Cl. B31b *49/04*; B65d *31/10, 33/00*
U.S. Cl. 93—35 SB **7 Claims**



A side sealed, gusseted bottom plastic bag and the method of forming the same wherein the bottom forming seams are reinforced by providing diagonal flat seals inwardly from the junction area of the gusset inner fold line and the side seal lines, to the gusset outer fold lines with the side seals connecting the ends of the gusset walls to the side walls being continued to the outer gusset folds, so as to relieve the stress at the junction point when the bag is filled and the bottom opened out into square or rectangular form.

3,618,479
AUTOMATIC POSITIONER FOR HOLD-DOWN MEANS
Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Co. Inc., Brooklyn, N.Y.
Filed Apr. 8, 1970, Ser. No. 26,621
Int. Cl. B31b *1/58, 1/98, 3/60*
U.S. Cl. 93—36.3 **4 Claims**



Apparatus for producing a folded tubular box from a box blank is provided with power driven means for adjusting the folding elements to operate on different size box panels. As the tubular boxes are produced, they are underfed into a stack and periodically a pile of boxes at the top of the stack is removed. While the boxes are in the stack, a hold-down means provides a downward force on the glue joint region connecting the inwardly folded panels of the box. A differential gearing unit interconnects the hold-down means with the power driven means for adjusting the folding sections so that as the apparatus is adjusted for different size boxes, the hold-down means is automatically positioned to apply a downward pressure at the joint region.

3,618,480

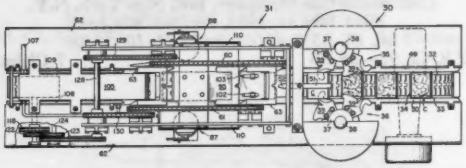
APPARATUS AND METHOD FOR CLOSING AND SEALING CARTONS

Ezra E. Theys, San Mateo, and Hugh B. Morse, San Jose, Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

Original application Feb. 17, 1969, Ser. No. 799,783, now Patent No. 3,587,411. Divided and this application June 12, 1970, Ser. No. 57,863

Int. Cl. B31b *1/04, 1/54, 3/26*

U.S. Cl. 93—49 R 4 Claims



An apparatus comprises folding and sealing stations for progressively folding adhesively treated carton flaps into superimposed relationship and for sealing the flaps together. The folding may be occasioned by a horizontally disposed tucker wheel positioned on each side of the carton for folding three minor flaps and a plow bar for folding a cover flap over the afore-mentioned minor flaps. The carton is then conveyed to the sealing station whereat a nozzle means moves along with the carton to discharge heated air onto juxtaposed portions of the carton flaps. Means are then provided for compressing the flaps together. A second embodiment incorporates the nozzle means into the tucker wheel to perform the folding and sealing steps substantially simultaneously.

3,618,481

APPARATUS FOR ERECTING CARTONS

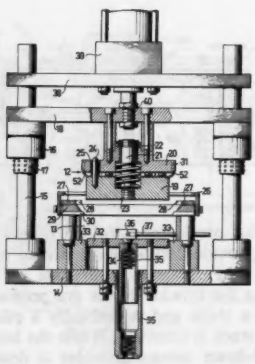
Rune G. A. Odenhagen, Malmo, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Feb. 2, 1970, Ser. No. 7,681

Claims priority, application Sweden, Feb. 12, 1969, 1,890/69

Int. Cl. B31b *1/46, 1/64, 3/74*

U.S. Cl. 93—51 R 11 Claims



An apparatus for erecting tray-like cartons having a marginal flange extending outwardly from the upper edge thereof in which the blanks are first subject to a preforming stage, then to an erecting stage and finally a stage for pressing the flange outwards to the desired position.

3,618,482

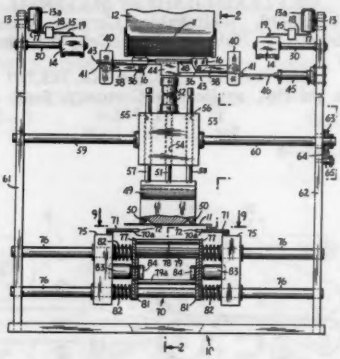
TRAY FORMING METHOD AND APPARATUS

Paul F. Bowman, 500 Northern Parkway, Ridgewood, N.J. 07450

Filed June 16, 1969, Ser. No. 832,933

Int. Cl. B31b *1/44*

U.S. Cl. 93—51 18 Claims



An "in-line" hydraulically or electrically operated tray forming apparatus is provided for folding paperboard blanks comprising a hopper for holding the paperboard blanks, a glue dobbing apparatus for applying controlled quantities of adhesive to the blank while the blank is in the hopper, a mandrel for removing the glued blank from the hopper and for urging the glued blank into a die cavity within which the blank is progressively folded into a tray.

3,618,483

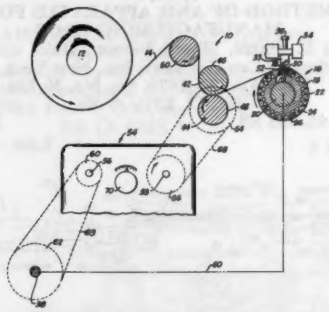
APPARATUS FOR REGULATING WINDOW PATCH LENGTH ON ENVELOPE AND BAG MACHINERY

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smith Machine Company, Inc., Duncansville, Pa.

Filed Apr. 17, 1970, Ser. No. 29,529

Int. Cl. B31b *1/82, 23/14;* B65c *1/00*

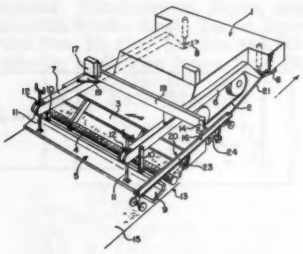
U.S. Cl. 93—61 A 8 Claims



Window patch cutting apparatus includes a pair of web pull rolls and a vacuum roll. The vacuum roll has a series of suction ports along the periphery and a patch cutting knife blade extending radially outwardly therefrom. The patch cutting knife blade on the vacuum roll severs window patches from a web when it moves into cutting relation with a fixed patch cutting knife blade positioned adjacent to the vacuum roll as the vacuum roll rotates relative to the fixed knife blade. The web pull rolls are drivingly connected to each other for rotation at substantially the same periphery speed and are spring loaded to

frictionally engage the patch material therebetween. The web pull rolls are connected to and driven by a variable speed drive mechanism. The variable speed drive mechanism is in turn drivingly connected to a portion of the envelope machine and is driven at machine speed in fixed ratio with the main drive shaft and other components of the envelope machine. The variable speed drive mechanism controls the peripheral speed of the web pull rolls and thus, controls the length of the window patch cut by the patch cutter knife, blades. An increase in the speed of the web pull rolls increases the length of the patch cut and conversely, a decrease in the speed of the web pull rolls reduces the length of the window patch. The speed of the web pull rolls can be increased or decreased while the envelope machine is running. The vacuum roll is driven at machine speed and the unsevered end of the window patch material slides on the surface of the vacuum roll until a portion is cut by the cutting knives.

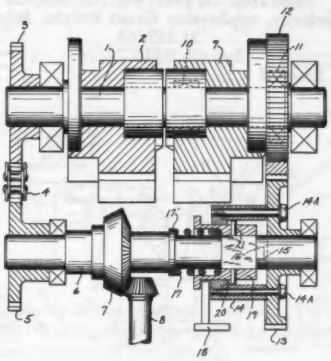
3,618,484
TRAVELING GRADE CONTROLLER
George E. Long, Rte. 2, Box 382, Monroe, Wash. 98272
Filed Sept. 11, 1969, Ser. No. 857,059
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 R **11 Claims**



A device for providing a grade reading at any given instant along a given course for a grade sensing unit of a traveling machine, such as a paving machine. An elongated grade follower arm or beam, vertically adjustable at both ends, is towed independently or by the traveling machine providing a grade reference point in contact with the grade sensor device of the machine. One end of the arm or beam is controlled for elevation from a known datum such as the surface just prepared. The opposite end of the arm is controlled by a slope sensing device mounted on the elongated grade follower arm and is raised and lowered to maintain a desired slope between the opposite ends of the frame. The slope controller may be programmed according to a desired profile to obtain a vertical curve of close tolerance, for instance, in a paved highway.

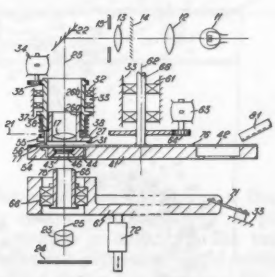
3,618,485
ECCENTRIC SHAKER FOR EARTH COMPACTING APPARATUS
Joachim Hermann, Munich, Germany, assignor to Wacker Werke KG, Munich, Germany
Continuation-in-part of application Ser. No. 790,960, Jan. 14, 1969. This application Nov. 16, 1970, Ser. No. 89,691
Claims priority, application Germany, Jan. 15, 1968, P 17 08 553.9
Int. Cl. E01c *19/30*
U.S. Cl. 94—48 **2 Claims**

The eccentric shaker for earth compacting has two eccentric bodies mounted on the eccentric supporting shaft on which one body is fixedly mounted and which is driven by a chain drive and disposed parallel to the control shaft, while the oppositely operating eccentric body is rotatably mounted upon the eccentric shaft and driven by a toothed gear transmission, the toothed gear of which is rotatably journalled upon the control shaft and forms a housing having two oppositely disposed



control tracks at the upper end and two oppositely disposed abutment cams at the bottom which cooperate with two oppositely disposed abutment cams upon an axially movable sleeve on the control shaft which is spring biased against the toothed gear and non-rotatably mounted on the control shaft by means of a multiple wedge element by way of a collar, a stud and a control device.

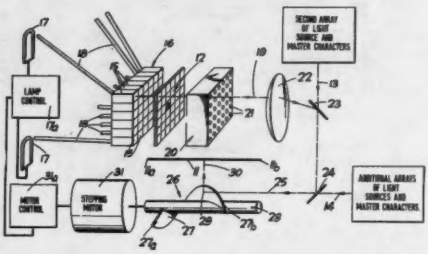
3,618,486
OPTICAL PROJECTORS
Brian Box English and Richard David Whyman, Edinburgh, Scotland, assignors to Ferranti, Limited, Hollinwood, England
Filed Aug. 12, 1970, Ser. No. 63,050
Claims priority, application Great Britain, Aug. 12, 1969, 40,274/69
Int. Cl. B41b *15/12*
U.S. Cl. 95—4.5 **6 Claims**



An optical projection system for projecting onto a sheet of photopaper the image of any selected one of an assortment of characters or other symbols in transparencies carried in bezel members (frames) around the rim of a magazine disc. The disc is rotatable stepwise to bring the selected symbol onto the optical axis of the projector, and a device is provided for lifting the associated bezel

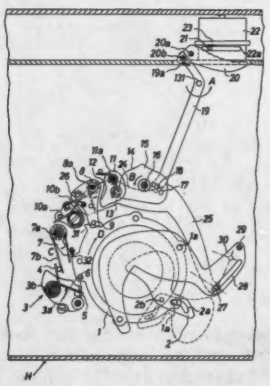
member upwards from the disc to bring the selected symbol into a more precise location both as regards the object plane and the optical axis of the system.

3,618,487
PHOTOCOMPOSING APPARATUS
Josef Maria Herbert Tiefenthal, Reigate, Surrey, and Howard Raymond Baylis, East Grinstead, Sussex, England, assignors to The Monotype Corporation Limited, London, England
Filed June 24, 1969, Ser. No. 835,958
Claims priority, application Great Britain, July 1, 1968, 31,252/68
Int. Cl. B41b 21/26
U.S. Cl. 95—4.5 5 Claims



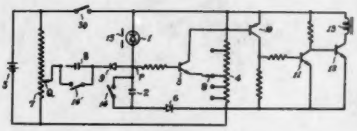
In the photocomposition of print characters a succession of print characters are projected optically on to a film using a helical reflecting surface which is rotated so that the reflected path moves progressively across the film. A plurality of lights selectively illuminate the required characters at the right instants as the reflected path moves across the film.

3,618,488
PHOTOGRAPHIC APPARATUS WITH BUILT-IN EXPOSURE CONTROLLING MEANS
Gunter Fauth, Unterhaching, Horst Guthke, Munich, and Willi Schulz, Schwenningen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed June 11, 1970, Ser. No. 45,486
Claims priority, application Germany, June 27, 1969, G 69 25 597.6
Int. Cl. G01j 1/00
U.S. Cl. 95—10 C 10 Claims



An exposure control which adjusts the shutter and the diaphragm of a photographic camera as a function of scene brightness employs a moving-coil instrument whose needle is movable in response to changes in scene brightness and can be engaged by a scanning member which thereby adjusts the diaphragms by way of two levers. The shutter has a rotary carrier for several blades and an impeller which can propel the carrier to thereby move the blades to open positions. The extent of such movement of the carrier determines the exposure time and is controlled by an arresting lever which is pivotable by the carrier and then strikes against the face of one of two cooperating timer cams the other of which is coupled to one of the levers. The faces on the timer cams are inclined in such a way that the positions of the levers, as selected by the scanning member, cannot be changed when the rotating carrier causes the arresting lever to strike against the one timer cam.

3,618,489
AUTOMATIC EXPOSURE TIME CONTROL FOR CAMERAS
Taiichi Akiyama, Okayashi, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo-to, Japan
Filed June 24, 1970, Ser. No. 49,422
Claims priority, application Japan, June 30, 1969, 44/51,946
Int. Cl. G03b 7/04, 9/62
U.S. Cl. 95—10 C 10 Claims

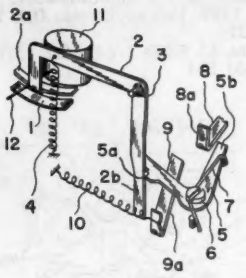


An apparatus for automatically determining exposure time in a camera which has a shutter which is opened to start an exposure and closed to terminate the exposure. A photosensitive element and a timing capacitor are connected in series to form a timing circuit with the charging of the timing capacitor taking place according to the intensity of light impinging on the photosensitive means. A switching circuit is triggered by the trigger voltage which forms the output of the timing circuit, and an automatic shutter-closing mechanism is actuated by the switching circuit to close the shutter and terminate the exposure when the trigger voltage of the timing circuit is reached. The voltage with which the timing capacitor is charged continuously increases as time elapses, and after a given voltage level is reached a voltage regulator responds automatically to this level for reducing the rate at which the voltage at the timing capacitor increases.

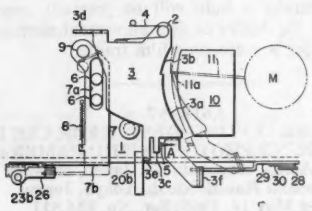
3,618,490
AMMETER POINTER ARRESTER FOR SINGLE REFLEX CAMERA EXPOSURE METERS
Akio Okamoto, Osaka-shi, and Syotaro Inagaki, Okazaki-shi, Japan, assignors to Minolta Camera Kabushiki Kaisha
Filed Oct. 13, 1969, Ser. No. 865,896
Claims priority, application Japan, Oct. 19, 1968, 43/91,390
Int. Cl. G03b 7/12
U.S. Cl. 95—10 C 3 Claims

A device for arresting a pointer of an ammeter for an exposure meter, which is interlocked, by actuation of an

automatic diaphragm controlling mechanism, to the preset diaphragm aperture so that the pointer is arrested and released by means of the pointer arresting device in accordance with the shutter release in a single reflex camera.



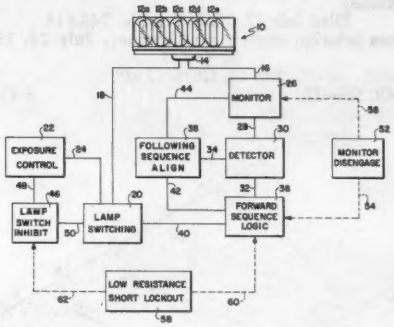
3,618,491
AUTOMATIC EXPOSURE ADJUSTMENT MECHANISM
Akio Furukawa, Yokohama-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 28, 1969, Ser. No. 880,746
Claims priority, application Japan, Nov. 29, 1968, 43/104,100
Int. Cl. G03b *7/14, 9/16*
U.S. Cl. 95—10 C **1 Claim**



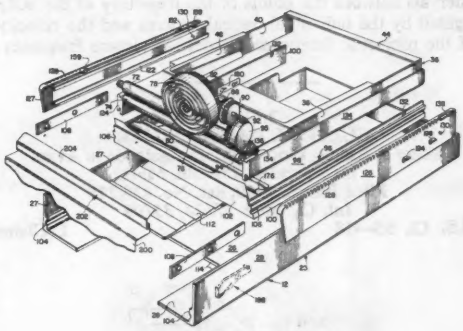
An automatic exposure adjustment mechanism wherein when the brightness of a subject to be photographed is higher than a predetermined level, the displacement of a shutter speed switching member is so controlled through an exposure meter pointer that a shutter may be actuated for a high speed exposure, whereas when the brightness of the subject is low, the displacement of said switching member is so increased that the shutter may be actuated for a low speed exposure and simultaneously the aperture diaphragms may be opened. A programmed shutter simple in construction may be easily provided and the exposure range may be further widened as compared with the conventional shutter wherein the shutter speed is constant while only the aperture is variable.

3,618,492
FLASH PHOTOGRAPHIC SYSTEM
Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Oct. 30, 1969, Ser. No. 872,644
Int. Cl. G03b *15/00;* **H04g** *1/24*
U.S. Cl. 95—11.5 **32 Claims**

A photographic flash exposure system operative to sequentially ignite individual flashlamps within an array of flashlamps. The system automatically passes a monitoring current through each of the flashlamps during each exposure cycle to derive alignment signals. These alignment signals function to align a flashlamp sequencing circuit to bypass inoperative flashlamps.



3,618,493
PHOTOGRAPHIC APPARATUS
Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed May 4, 1970, Ser. No. 34,181
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **34 Claims**



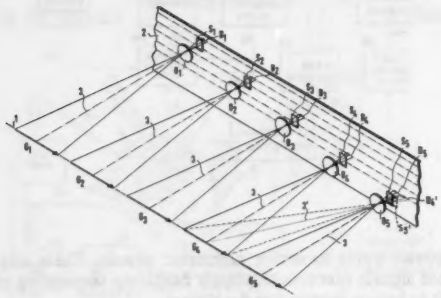
A self-developing camera comprising a film transport and processing system including a pair of pressure applying rollers rotatable to advance a film unit therebetween and distribute a processing liquid within the film unit, a film feeding device for moving a film unit from exposure position into the bite of the rollers and a drawer adapted to be reciprocated manually to operate the film feeding device and tension a spring drive for rotating the rollers. The drawer is designed to transport a film unit to a storage position following distribution of the processing liquid and provide an expandable, light-free environment for the film unit during movement thereof. The camera also includes an exposure system which is preset, prior to exposure, by manual movement of the drawer.

3,618,494

METHOD AND APPARATUS FOR PHOTOGRAPHING RAPIDLY MOVING BODIES

Peter Bettermann, Monchen-Gladbach, and Henning Dechow, Wittlaer, near Dusseldorf-Kaiserswerth, Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed July 17, 1968, Ser. No. 745,616
Claims priority, application Germany, July 28, 1967, R 46,601
Int. Cl. G03b 35/08
U.S. Cl. 95—18 5 Claims



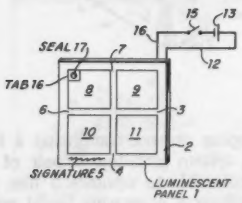
A method and an apparatus for photographing rapidly moving bodies, especially projectiles or the like, in which the rapidly moving body is imaged on a moving film strip by means of several picture-taking optical systems which are arranged along the trajectory of the body, the film velocity being so chosen that the ratio of the velocity of the body to the velocity of the film substantially corresponds to the optical image ratio of the optical systems to avoid relative movement between image and film, and the optical systems being so arranged and directed that the intervals between the points of the trajectory of the body sighted by the individual optical systems and the velocity of the projectile determine the desired picture frequency.

3,618,495

MULTIPLE IMAGE CAMERA

Roger J. Kuhns, Lincoln, Mass., assignor to Avant Incorporated, Lincoln, Mass.

Filed June 5, 1969, Ser. No. 830,775
Int. Cl. G03b 17/24, 35/08
U.S. Cl. 95—18 1 Claim



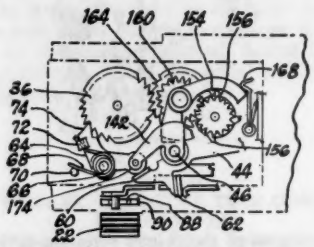
This disclosure is directed toward a multiple image camera for simultaneously producing four photographs of a subject positioned in front of the camera upon a standard film format and includes a novel luminescent panel positioned adjacent the focal plane of the camera for producing white borders surrounding each of the four images photographed upon the film at the focal plane.

3,618,496

AUTOMATIC FLASHCUBE ADVANCING MECHANISM

George Irwin, 1747 Elmwood Drive, Highland Park, Ill. 60037

Continuation-in-part of application Ser. No. 816,951, Apr. 17, 1969. This application Oct. 7, 1969, Ser. No. 864,375
Int. Cl. G03b 1/14, 1/62, 15/04
U.S. Cl. 95—31 FM 7 Claims



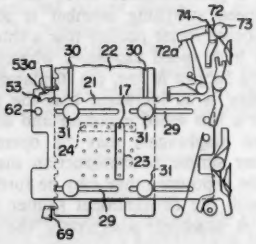
A camera construction including a housing holding a length of film having spaced apart perforations used for locating successive frames in the film. The film advancing mechanism is associated with a flash lamp socket which holds a lamp having a plurality of flash bulbs whereby a fresh bulb can be moved to picture taking position simultaneously with the movement of a succeeding film frame to the picture taking position. The drive means for the lamp comprise a drive gear and associated clutch. Detents are formed on a member which is associated with the drive gear, and a finger engages the detents to stop rotation of the bulb socket before completion of the film advancing movement whereby a bulb will be precisely positioned irrespective of the degree of film movement necessary for properly locating a succeeding film frame.

3,618,497

APERTURE SETTING DEVICE FOR USE IN COMPOUND PHOTOGRAPHIC CAMERA

Hisanori Ataka, Kawasaki-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

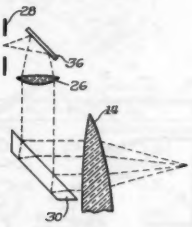
Filed May 14, 1969, Ser. No. 824,511
Claims priority, application Japan, May 16, 1968, 43/33,070
Int. Cl. G03b 19/02, 27/42
U.S. Cl. 95—36 R 2 Claims



An aperture setting device for a compound photographic camera wherein each of a first and second movable plates, arranged so as to move at right angles relative to each other, has an elongated slot formed at a right angle relative to the movements. The intersection of these elongated slots forms an aperture; and when the first movable plate is displaced to its end of movement, it actuates the pawl for the second movable plate so as to

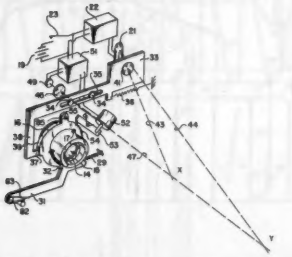
advance it by one step or row while the first movable plate, which has been prevented from the reverse motion, is returned to its initial position. The aperture formed by the slots corresponds to one of apertures formed immediately behind the objective lens. Each of the movable plates is returned to its initial position by actuating elements from the exterior of the camera so as to release a member in engagement with the plate.

3,618,498
CHROMATIC RANGEFINDER
Hans J. Eppinger, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed July 23, 1970, Ser. No. 57,600
Int. Cl. G03b 3/00
U.S. Cl. 95—44 C **3 Claims**



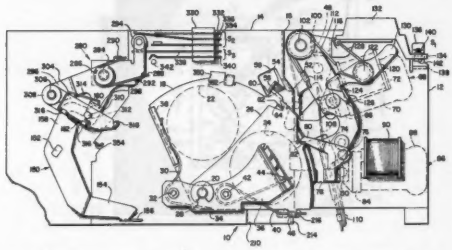
Disclosed is an improvement in an optical rangefinder system for a camera having a reflex type viewfinder and a focusable variable focal length lens, the system providing a superimposed image viewing system by interposing in the optical path of the lens a single parallel planar surfaced mirror coated on the rear surface to be totally reflecting and on the front surface with a dichroic material to reflect to the viewfinder a first chromatic component of an image and to transmit to the reflecting surface remaining chromatic components of the image, which latter surface reflects the image into the viewfinder in coincidence with the first chromatic component as a neutral color of a subject in the image when the objective is in focus on the subject and out of coincidence so as to generate color fringing of the subject in the image when the objective is out of focus on that subject.

3,618,499
CAMERA WITH COORDINATED APERTURE AND FOCUS ADJUSTMENT MEANS
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,459
Int. Cl. G03b 3/00
U.S. Cl. 95—45 **5 Claims**



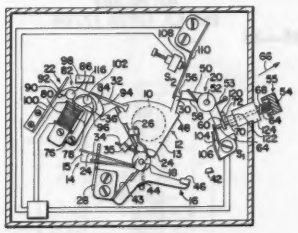
A camera having both focusing and lens aperture adjustments is provided with a coordinating mechanism for automatically varying the lens focus adjustment as a function of the lens aperture adjustment, so as to insure maximum depth of field. In a preferred embodiment of the invention, this mechanism is incorporated in a camera provided with an automatic rangefinder lens focusing system, so that when the traverse of the rangefinder fails to detect a subject at a close distance, the lens is then adjusted to its shortest hyperfocal setting compatible with the concurrent adjustment of lens aperture.

3,618,500
PHOTOGRAPHIC EXPOSURE CONTROL SYSTEM WITH AUTOMATIC COCKING MECHANISM
Lawrence M. Douglas, Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed June 30, 1969, Ser. No. 837,672
Int. Cl. G03c 7/00
U.S. Cl. 95—53 **34 Claims**



A mechanism for automatically cocking the spring loaded elements of an exposure control mechanism following a photographic exposure. The mechanism utilizes a motion transferring member which moves reciprocally and in correspondence with a motor driven reciprocable cocking arm. A switch actuator member is operative to respond to the movement of one element of the exposure mechanism to permit energization of the motor and is repositioned to a standby status for de-energizing the motor by mechanical interaction with the motion transferring member.

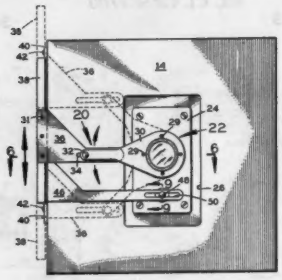
3,618,501
PHOTOGRAPHIC EXPOSURE CONTROL APPARATUS
Alfred H. Bellows, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation of application Ser. No. 688,176, Dec. 5, 1967. This application Nov. 19, 1969, Ser. No. 871,673
Int. Cl. G03b 9/26
U.S. Cl. 95—60 **9 Claims**



A photographic exposure control mechanism which includes two exposure influencing blades. The movement of the blades is governed by an electromagnetically controlled latch. The latch is capable of releasably retaining one blade against movement while permitting movement of the other blade. A resilient member extends from the other of the blades and operates during blade return to advance the latch from its position associated with blade release to its blade retaining position, where it is capable of holding one blade against movement. During exposure,

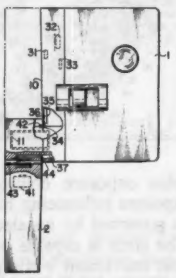
the other of the blades is released to terminate the exposure. Thereafter, the blades are returned to their initial positions where they are reset for further operation.

3,618,502
DEVICE FOR ADJUSTING DIAPHRAGM OF CAMERA
Gerald C. Congrove, 1481 S. Ocean Blvd., Pompano Beach, Fla. 33062
Filed Aug. 5, 1969, Ser. No. 847,583
Int. Cl. G03b *5/02, 9/02, 17/12*
U.S. Cl. 95—64 R **7 Claims**



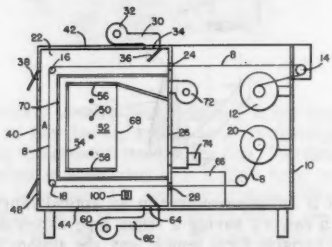
A device for adjusting the diaphragm control of a process camera from a position remote from the lens assembly of the camera so as to provide better access for making the adjustments. The device includes a scale mounted for movement relative to a lens board of the camera and readily accessible for viewing. An indicator can be moved relative to the scale and also moves with the scale. The scale and the indicator are respectively coupled to the lens assembly and the diaphragm control by arm linkages which permit movement of the lens assembly of the camera without relative movement between the scale and the indicator. Relative movement between the scale and indicator rotates the diaphragm control to any desired setting of the diaphragm.

3,618,503
MOVIE CAMERA
Yoshizo Ikegami and Saichiro Ohashi, Nishinomiya-shi, Hyogo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan
Filed Aug. 21, 1969, Ser. No. 851,916
Claims priority, application Japan, Aug. 23, 1968, 43/60,389
Int. Cl. G03b *17/04*
U.S. Cl. 95—86 **4 Claims**



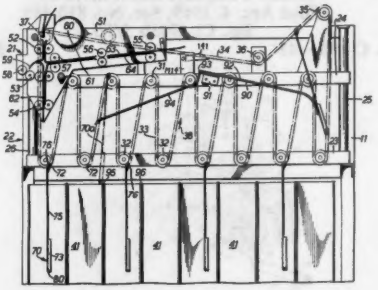
A rotatable grip is mounted on a camera body and carries an electrical contact to be brought into contact with a stationary contact on the camera body only when the grip is moved to extended picture taking position to close the electrical circuit of the automatic exposure control. Another movable contact is provided on the grip to be brought into contact with a second contact on the camera body only when the grip is moved to the retracted position to close an electrical circuit for checking the capacity of the storage cell in the camera.

3,618,504
OPTICAL DEVELOPMENT PROCESS AND APPARATUS
Richard A. Fotland, Lyndhurst, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated
Filed Oct. 9, 1968, Ser. No. 766,160
Int. Cl. G03d *13/00*
U.S. Cl. 95—89 **9 Claims**



An apparatus for rendering visible, the faintly visible or entirely invisible latent image produced by photographic exposure of a free radical film to a small dose of radiation; the apparatus being adapted to process the film by dry means only.

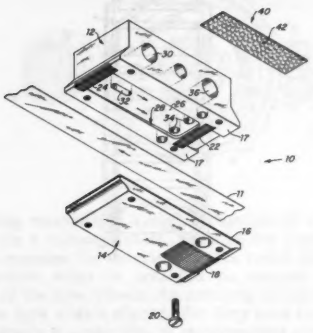
3,618,505
AUTOMATIC PHOTOGRAPHIC APPARATUS
Charles W. Clark, Maidenhead, Berkshire, England
Filed Nov. 20, 1968, Ser. No. 777,323
Claims priority, application Great Britain, Nov. 20, 1967, 52,751/67
Int. Cl. G03d *3/10*
U.S. Cl. 95—89 D **3 Claims**



Automatic development apparatus for dipping a sheet of exposed photo-sensitive sheet material successively into liquids contained in a number of process tanks. The sheet is contained in a carrier which is attached to conveyor means such as a chain which imparts to the carrier a movement such that as the carrier is withdrawn from

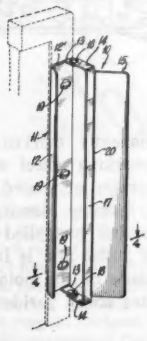
the process tanks it is drawn up the wall of the tank and over the edge of the tank to wipe excess liquid from the carrier.

3,618,506
RAPID PHOTOGRAPHIC PROCESSOR
Samuel Kitrosser, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed June 26, 1969, Ser. No. 836,894
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 R 11 Claims



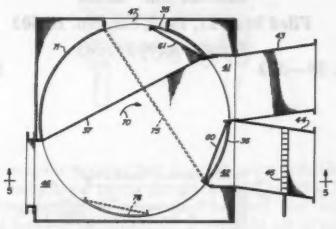
A self-threading continuous flow photographic processing system consisting of alternately located roller pairs and chemical treating modules. The roller pairs drive the film through the chemical treating modules and into a film dried. Each chemical treating module has a narrow tapered processing chamber with resilient lip seals at the film entrance and exit. The tapered processing chamber is located above the film path and has fluid ingress means and fluid egress means to supply photographic processing reagents to develop the film. The lip seals and a surface tension contact seal set up between the film being processed and the tapered chamber result in a relatively spillproof chamber.

3,618,507
APPARATUS FOR THE VENTILATION OF MOVING VEHICLES
William J. Rakocy, Clifton, N.J., assignor to Ronson Corporation, Woodbridge, N.J.
Filed Dec. 8, 1969, Ser. No. 882,890
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.12 2 Claims



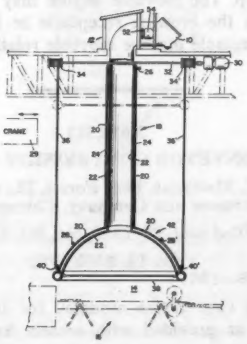
The present invention relates to a new type of apparatus to ventilate moving vehicles such as helicopters, by directing a stream of air into the confines of the vehicle. The amount and direction of this air is controlled by moving the attachment which consists of a wind direction plate and fastening means, through an infinite number of selectively variable positions.

3,618,508
AIR MIXING APPARATUS
Richard D. Tutt, Tucson, Ariz., assignor to Krueger Manufacturing Company
Filed Feb. 27, 1970, Ser. No. 15,042
Int. Cl. F24f *13/04*
U.S. Cl. 98—38 6 Claims



A pair of discs mounted in spaced apart relation are mounted for rotation about an axis and are enclosed within a box structure. The enclosure includes openings for receiving inlet air to be mixed and an outlet opening for the mixed air; the enclosure also includes a vent opening for returning or "dumping" undelivered conditioned air to the conditioning system. A plurality of baffles are mounted between the discs and are positioned to open and close the various openings in the enclosure in accordance with the angular position of the discs.

3,618,509
COLLAPSIBLE VENTILATION SYSTEM
John A. Nichols, Canton, Mass., assignor to Mill Industries, Inc.
Filed Aug. 13, 1970, Ser. No. 63,501
Int. Cl. F23j *11/02*
U.S. Cl. 98—115 13 Claims



A collapsible ventilation system for ventilating or exhausting an air space wherein the system has an inflat-

able and collapsible duct secured in communicating relationship to an exhaust duct located above the air space. A drum and cable arrangement driven by at least one motor is connected to the lower portion of the inflatable duct for raising and lowering the duct, and means are provided for supplying air to the duct to inflate it into position. Preferably, heated air is used to prevent undesirable condensation in the duct when used in a relatively cooler ambient atmosphere.

3,618,510

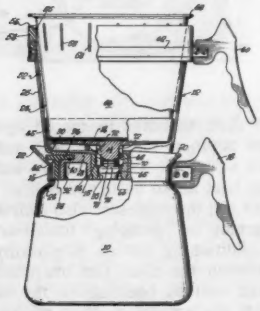
INFUSION APPARATUS

Frederick Merrill Varney, 3036 Platten Drive, Fairfax, Va. 22030

Filed Mar. 11, 1970, Ser. No. 18,503

Int. Cl. A47j *31/043*

U.S. Cl. 99—302 **39 Claims**



A filter-equipped brewing receptacle containing heated water and ground coffee seats on a boiler receptacle in which the water has been heated and when the coffee is brewed to the desired degree, steam in the boiler receptacle is condensed to create a vacuum to draw the brew through the filter and through an initially closed valve into the lower boiler receptacle. The brewing receptacle is made in two separate sections one of which is manually movable downward to open the valve to start the filtration step. The movable section may be an auxiliary container in the brewing receptacle or the bowl of the brewing receptacle may be movable relative to a brewing bowl base.

3,618,511

CONVEYOR COMPRESSION CAGE

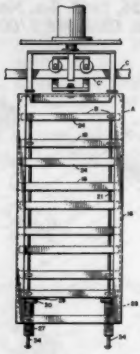
Will C. Matthews, Park Forest, Ill., assignor to Armour and Company, Chicago, Ill.

Filed Aug. 25, 1970, Ser. No. 66,847

Int. Cl. B30b *7/02*

U.S. Cl. 100—194 **9 Claims**

An outer cage frame mounted for travel on a conveyor rail or provided with wheels for conveying on floors is provided with spaced screen shelves and encloses an inner slidably-related frame having spaced presser screens, with spring means urging the presser screens toward the shelves, power means being provided to open spaces between the presser screens and shelves for loading



and unloading the shelves while energizing the springs, and also effective for releasing the spring energy for moving the inner frame to compress objects loaded onto the screen shelves.

3,618,512

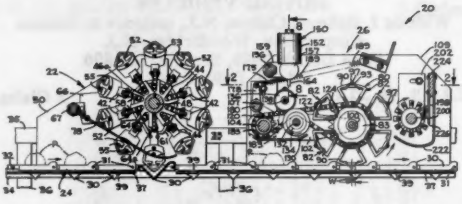
APPARATUS FOR MARKING POTATOES OR THE LIKE

Arthur F. Kalmar and Harold J. Mumma, Riverside, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed June 13, 1967, Ser. No. 645,799

Int. Cl. B44b *5/00*

U.S. Cl. 101—5 **2 Claims**



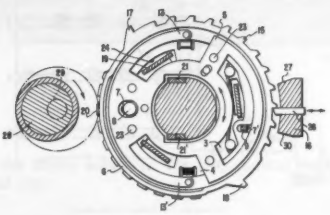
A potato is permanently marked by being passed beneath a rotatable marking wheel which has attached at its periphery a plurality of spaced groups of needles arranged in patterns forming identifying indicia to be applied to the potato. Ink is applied to the tips of the needles by a transfer roller and is introduced into the outer cortical cell tissue of the potato by the needles which pierce the outer corky periderm layer.

3,618,513

PRINTING MECHANISM INCLUDING RESILIENTLY BIASED ROTATABLE-TYPE WHEELS

Gerhard Merker, Braunschweig, Germany, assignor to Olympia Werke A.G., Wilhelmshaven, Germany

Filed Dec. 18, 1969, Ser. No. 886,153
Claims priority, application Germany, Dec. 20, 1968, P 18 15 930.3, Oct. 14, 1969, P 19 51 731.8
Int. Cl. B41j 1/28
U.S. Cl. 101—91 14 Claims



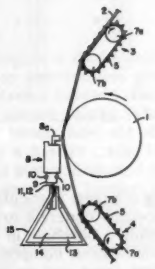
A printing mechanism having a plurality of type wheels mounted on a common shaft. Each of the type wheels is resiliently mounted for movement in the radial direction and an impression roller is arranged to contact the outer periphery of the type wheels. An arresting device is provided to keep the type wheels aligned after they have been set. The arresting device is a plurality of reciprocating members that engage the type wheels and hold them in place. These reciprocating members may be either a single pin that engages special teeth in a portion of the periphery of the type wheels, or they may be an arrangement with two claws which engage in recesses between the type on the type wheels. In the former, the type wheels are resiliently biased by springs mounted within the wheels themselves, and in the latter they are biased by springs mounted in the arresting device.

3,618,514

APPARATUS FOR PRODUCING INCREMENTAL MOVEMENT, PARTICULARLY FOR MOVING A PRINT HAMMER MODULE PARALLEL TO PRINT LINE

Alexander Nyman, Dover, and Robert H. Curtiss, Wayland, both of Mass., assignors to Mohawk Data Sciences Corporation, Hirkimer, N.Y.

Filed June 24, 1969, Ser. No. 835,998
Int. Cl. H02k 41/02; B41j 9/04
U.S. Cl. 101—93 C 14 Claims



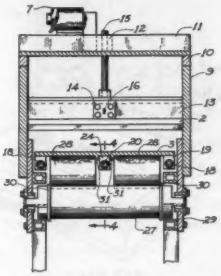
Apparatus within a printer for incrementally moving a hammer module parallel to a line on which characters are being printed. The hammer module is carried across the paper by a coil which moves within a track extending parallel to the print line and formed by parts of pole pieces arranged to provide magnetic fields spaced along and extending across the track in alternating opposite directions. A U-shaped ceramic permanent magnet encloses portions of a pole piece of one polarity while portions of the pole piece of the other polarity surround the outside surface of the U-shaped magnet. Energization of the coil in alternate directions causes the hammer module to move in successive increments.

3,618,515

PLANOGRAPHIC SCRAPER BAR PRINTING PRESS

Thomas A. Schofield, 628 W. Canfield, Detroit, Mich., and Arthur T. Schofield, 7000 Oakes Road, Brecksville, Ohio

Filed May 18, 1970, Ser. No. 38,014
Int. Cl. B41l 17/04
U.S. Cl. 101—130 15 Claims



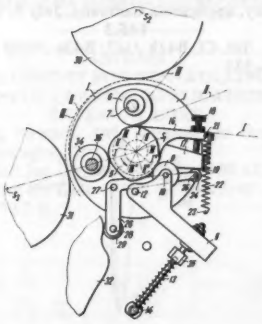
A planographic scraper bar printing press suitable for fine art prints including a motor for driving the printing bed, such motor being positively connected to such bed with a ball screw and ball nut arrangement; a pyramid set of hollow bed support rollers; a motorized scraper bar adjustment; a pressure sensitive switch to shut off such bar motor at a predetermined scraper bar pressure; and switching means to automatically shut off the bed drive motor when the scraper bar reaches the end of the printed paper.

3,618,516

SUPPORT FOR OFFSET CYLINDERS OF PRINTING MACHINES

Josef Jurny, Sebranice, Czechoslovakia, assignor to Adamovske Strojirny, narodni podnik, Adamov, Czechoslovakia

Filed Aug. 4, 1969, Ser. No. 847,083
Int. Cl. B41f 7/04, 13/36
U.S. Cl. 101—218 8 Claims

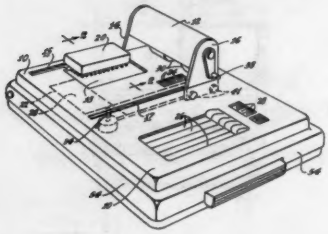


Offset cylinders of printing cylinders are mounted rotatably on a shaft, provided at both ends with formed discs with equally shaped circumferences. The shaft is supported in the sidewalls of the machine by sets of adjustable rollers bearing against said formed discs. At one end of said shaft is fixed a sleeve and mounted pivotably a lever provided with means for adjustment of their relative position. Control cam means are provided, acting on said lever pivotably mounted on the shaft, adjusting the position of said formed discs with respect to their supporting rollers and thus also the position of the offset cylinder with respect to the form cylinder and pressure cylinder.

3,618,517
CREDIT CARD VERIFICATION APPARATUS AND SYSTEM

Davies Allport, La Jolla, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Jan. 9, 1970, Ser. No. 1,631
Int. Cl. B41f 3/04; G06k 7/02; H04q 3/70
U.S. Cl. 101—269 4 Claims

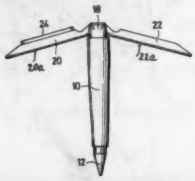


A credit card verification system is provided whereby credit cards may be quickly checked at their point of use to determine whether a particular card is valid, or whether it has been invalidated because of loss, for example, or because of nonpayment; and also which may be checked to determine whether or not the term for which a card was issued has expired. The verification apparatus and system to be described is one in which the expiration date of the card is checked by pneumatic means, in a simple adjustable unit which may, for example, be attached directly to the card imprinter at the point of use; and in which a serial number coded on the card by means, for example, of embossments, is read, likewise by pneumatic means, and the resulting signals are compared in an electronic system with signals stored in the system and which are indicative of the invalid cards. The electronic system may be located at the point of use of the cards, or at a central station.

3,618,518
MARKING UTENSIL

Herbert Rigoni, Am sommerberg 171, 7731 Fischbach, Germany

Filed July 6, 1970, Ser. No. 52,191
Claims priority, application Germany, July 7, 1970, G 70 22 145.3
Int. Cl. B41k 1/42; B43k 29/00
U.S. Cl. 101—333 10 Claims

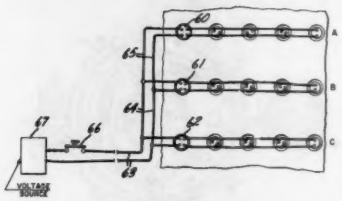


A barrel has a front end provided with marking means such as a nib of a pen or an analogous means. Connected to the rear end of the barrel is a pair of carrier arms which may separately pivot about an axis normal to the elongation of the barrel between an inoperative position in which they both extend lengthwise of the barrel in parallelism with one another and an operative position in which they both extend transversely to the elongation of the barrel. A stamp is provided on one of the arms and an ink pad is provided on the other of the arms on such surfaces of the arms that the stamp will contact the ink pad when the arms are in their inoperative position. A friction cap removably surrounds the arms when the latter are in inoperative position.

3,618,519
TIMED SEQUENCE BLASTING ASSEMBLY FOR INITIATING EXPLOSIVE CHARGES AND METHOD

George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Dec. 23, 1968, Ser. No. 786,213
Int. Cl. F42d 1/06
U.S. Cl. 102—22 3 Claims



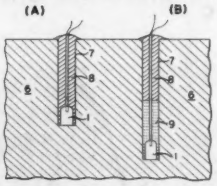
A blasting assembly for timed sequence blasting is provided in which a blasting cap and an electronic timing device are interconnected for detonating a series of explosive charges in sequence. The timing device includes a pulse discharge circuit and a silicon-controlled rectifier which, in combination, receive, store, and then after a predetermined delay, permit current to flow to the blasting cap and detonate it and any explosive charges associated with it.

A method for a timed delay blasting is also provided, in which an electrical charge is established and temporarily stored in a timing device, and released to a blasting cap after a predetermined delay.

3,618,520
METHOD OF CRACKING CONCRETE

Masafumi Hamasaki, and Noriaki Nakashima, both of Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 4, 1969, Ser. No. 796,445
Int. Cl. F42d 1/08
U.S. Cl. 102—23 5 Claims



Method of cracking concrete particularly useful for removing obsolete or unnecessary concrete structures in urban area which comprises drilling a borehole in concrete, filling thus drilled hole with a combustible composition mainly comprising a metallic reducing agent and an oxidizer, tamping thus filled borehole securely and igniting said combustible composition to crack the concrete.

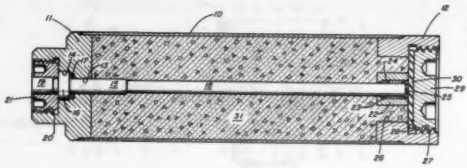
3,618,521
PROPELLANT GAS GENERATOR

Louis J. Montesi, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 7, 1969, Ser. No. 839,494
Int. Cl. F42b 9/18; C07c 79/10
U.S. Cl. 102—39 5 Claims

An elongate substantially cylindrical-shaped housing substantially filled with a large volume of propellant and having

disposed along the longitudinal axis thereof a fast burning, metal clad insensitive explosive line for initiating the propellant along the entire length of the longitudinal axial line in microsecond time.

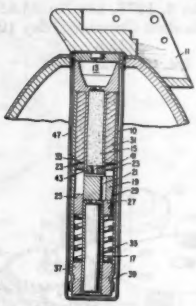


3,618,522

DUAL SAFETY GRENADE FUZE

John E. Henderson, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed Sept. 29, 1969, Ser. No. 861,851
Int. Cl. F42c *15/36*
U.S. Cl. 102—64 10 Claims



This invention relates to a dual safety time delayed fuze, useful, for example, in conventional grenades, and particularly to a biased barrier between the pyrotechnic delay charge and the fuze ignitor charge. The barrier contains a flash-hole which is normally held out of alignment with the fuze powder train by a barrier latch. Upon ignition of the delayed charge, a heat motor, activated by the burning of the charge, expands against the barrier latch, displacing it, thereby allowing the biasing element to drive the barrier flash-hole into alignment with the delay and the ignitor. The barrier flash-hole may optionally contain a lead charge to insure ignition of the fuze.

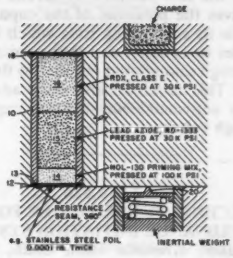
3,618,523

STAB-ELECTRIC DETONATOR

Richard L. Hiquera, Stresau, and H. F. Richard, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 6, 1970, Ser. No. 34,931
Int. Cl. F42c *19/12*
U.S. Cl. 102—70.2 A 12 Claims

A detonator which can be initiated by either electrical or mechanical stimulii and which is safe against premature initiation until the fuze of which it is a component has been fired. The detonator consists of a length of tubing closed at one end by means of an extremely thin metal diaphragm which is loaded with a stab-sensitive priming mix in direct contact with the metal diaphragm and other explosives necessary for the desired output characteristics.

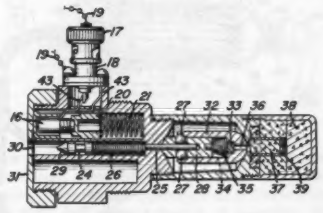


3,618,524

ELECTRICAL DELAY ARMING ALWAYS IMPACT FUZE

Aaron S. Berlin, Wilmington, Del., and Vincent C. Little, Fallston, Md.

Filed Sept. 4, 1968, Ser. No. 757,298
Int. Cl. F42c *11/00, 15/40, 19/12*
U.S. Cl. 102—70.2 R 11 Claims



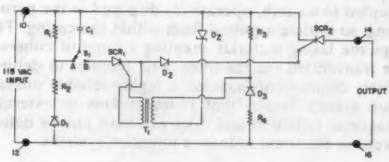
A fuze, method, and system for arming munitions for low altitude delivery wherein the energy source for arming the fuze is self-contained within the mechanism and utilized subsequent to release of the munition from the delivery means.

3,618,525

ELECTRICAL CIRCUIT FOR CONTROLLING THE TIME DURATION OF CURRENT APPLICATION TO AN EXTERNAL LOAD

Fred A. Fritz, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 13, 1969, Ser. No. 790,623
Int. Cl. F42c *11/06, 11/00, 15/40*
U.S. Cl. 102—70.2 R 5 Claims



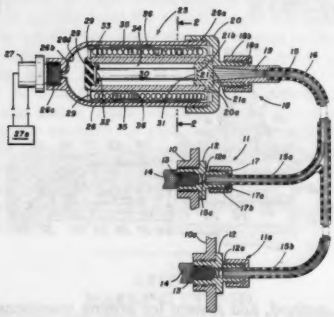
This is an electrical circuit for time limiting the application of current to an external load. A charging network is fed by alternating current having a capacitor charged through resistance means and a diode when a switching element is positioned conductive between the capacitor and resistance means. A pulsing network is fed by the alternating current which network has a transformer, resistance means, diode and Zener diode providing a pulse to a first silicon controlled

rectifier on the half-cycle when the switching element is positioned nonconductive between the capacitor and the resistance means and is positioned conductive between the capacitor and the first rectifier. A second silicon controlled rectifier receives the potential of the capacitor through the first rectifier in its conducting state which in turn allows the second rectifier to conduct and thus permit the capacitor to discharge through said second rectifier to the external load to be controlled. This circuit is particularly adapted to the firing of electrically activated delay blasting caps without arcing when using high voltage.

3,618,526
PYROTECHNIC PUMPED LASER FOR REMOTE ORDNANCE INITIATION SYSTEM

Robert L. Baker, Granada Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 26, 1969, Ser. No. 861,395
Int. Cl. F42b *5/08*
U.S. Cl. 102—70.2 **6 Claims**



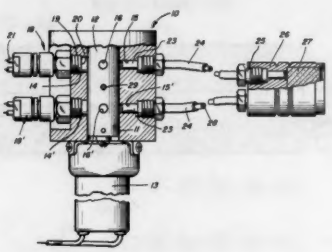
A bundle of fiber-optic strands extends to a plurality of detonator assemblies each mounted on an individual ordnance having a portion responsive to coherent light for detonating the ordnance. The opposite end of the fiber-optic bundle is connected to a "one shot" pyrotechnic actuated laser apparatus. The apparatus includes a tubular outer case, the inner surface of which is coated with a pyrotechnic material, coaxially positioning a laser material having an oppositely disposed, totally reflective surface and a partially transparent mirror surface. An external high-voltage source is coupled to a squib, operatively disposed in the pyrotechnic coating, to initiate a pulsed flash within the casing. The flash pumps the lasing material, creating a burst of coherent light to be transmitted via the fiber-optic bundles to detonate the remotely disposed ordnances. A highly reliable ordnance initiation system results that is impervious to external electromagnetic radiation and does not have circuit deficiencies inherent in electrical ordnance initiation systems.

3,618,527
SAFETY AND ARMING DEVICE

Earl E. Kilmer, College Park, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Dec. 23, 1968, Ser. No. 786,133
Int. Cl. F42c *15/40, 15/34, 15/00*
U.S. Cl. 102—76 R **8 Claims**

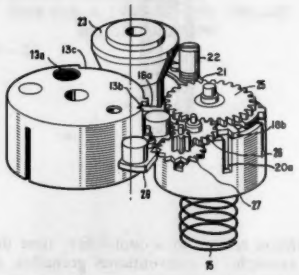
A safety and arming device having a mild detonating explosive fuze train of insensitive heat resistant explosives for centrally detonating a very large explosive charge and being separated in a safe, unarmed position from an initiating detonator by an electrically actuated normally out-of-line interrupter.



3,618,528
SAFETY ARRANGEMENT FOR FUSES FOR NONSPINNING PROJECTILES, MORE PARTICULARLY ROCKET PROJECTILES

Josef Muller, Schramberg-Sulgen/Wurttemberg, Germany, assignor to Gebruder Junghans G.m.b.H., Schramberg/Wurttemberg, Germany

Filed May 8, 1970, Ser. No. 35,654
Claims priority, application Germany, May 10, 1969, P 19 24 025.6
Int. Cl. F42c *15/24*
U.S. Cl. 102—78 **7 Claims**



A safety apparatus for projectile fuses which includes a primer carrying swing slide and an inertia weight. A stop sleeve surrounds and cooperates with the inertia weight to control its movement, with the controlled movement of the inertia weight in turn controlling the movement of the swing slide from a safe to an armed position.

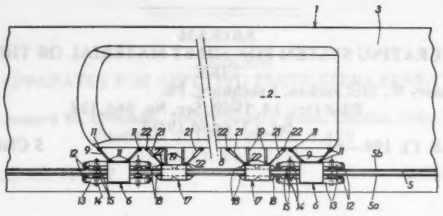
3,618,529
TRACKED AIR-CUSHION VEHICLE OR LIKE MACHINE POWERED BY LINEAR INDUCTION MOTOR

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed Dec. 11, 1968, Ser. No. 782,801
Claims priority, application France, Apr. 29, 1968, 149,968
Int. Cl. B61b *13/04;* **B60l** *9/00*
U.S. Cl. 104—23 FS **2 Claims**

A tracked air-cushion vehicle powered by a linear induction motor whose armature is incorporated in a laterally offset, upward extension of the guideway over which the body

portion of said vehicle moves at a distance from said extension, said body portion carrying, in outside projection, the in-



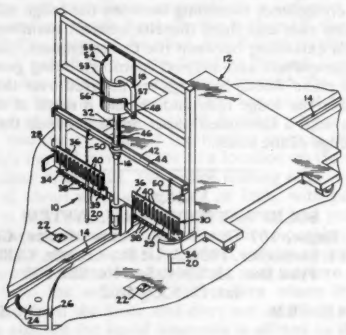
ductor of said motor and a guiding device engaging the opposite faces of said extension.

3,618,530

SWITCH ACTUATING APPARATUS FOR TOW TRUCKS

Horace M. Swartz, Doylestown, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 29, 1969, Ser. No. 888,696
Int. Cl. B61l *13/02*; **B65g** *17/12*
U.S. Cl. 104—88 **8 Claims**



A switch actuating apparatus for use in a tow truck system includes two vertically slotted and horizontally notched probe mounting members disposed on either side of the tow pin of a conveyor truck to uniquely guide and position the probes. The probes cooperate with said slots and notches so as to swing forwardly when contacted from the rear, and are connected to a probe lifting device which is vertically movable between a raised inoperative position and a lowered operative position. The handle for the probe lifting device is located adjacent the tow pin handle and both are mounted in a handle housing whereby when the tow pin is raised the probes are necessarily raised, and when the probes are lowered the tow pin must also be lowered.

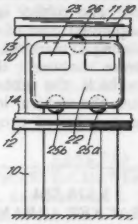
3,618,531

TRANSPORTATION SYSTEM

Willi Eichholz, Gr. Hakenstrasse 48, 56 Wuppertal-Barmen, Germany

Filed May 28, 1968, Ser. No. 732,636
Int. Cl. B61b *5/02*; **E01b** *25/08*
U.S. Cl. 104—121 **1 Claim**

A transportation system including vehicles running in a substantially continuous row between two parallel guide surfaces by means of lower and upper wheels engaging said upper and lower guide surface but being freely movable with respect thereto. The lower wheels serve for supporting and steering the vehicles and at least one upper wheel serves for controlling the appropriate inclination of the vehicle with regard to the guide surface. A guide surface may be provided with a guide track separating at bifurcations. A feeler associated with the vehicle engages the guide track, so that the



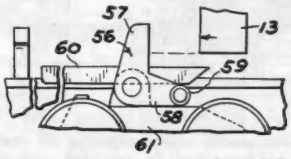
vehicle will follow the one or the other branch of the guide surface at a bifurcation.

3,618,532

CONVEYOR SYSTEM

Merle E. Clewett, Bushey Heath, and James A. Cornish, Isleworth, both of England, assignors to American Can & Cable Company, Inc., New York, N.Y.

Filed June 16, 1969, Ser. No. 833,369
Int. Cl. B65g *17/42*; **B61j** *1/12*
U.S. Cl. 104—172 S **6 Claims**



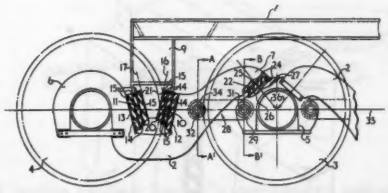
A conveyor system including a first load supporting track and a second load supporting track with an intermediate transfer portion. A powered conveyor is provided in association with the first and second tracks. A plurality of carriers are provided. Each of the carriers has a first dog that is in position for normal engagement with the pusher member of the conveyor and a second dog that is normally not in carrier pushing position. Means are provided at the transfer portion for moving the second dog into carrier transferring position.

3,618,533

ELASTOMERIC RAILWAY VEHICLE SPRING SUSPENSION

Archie J. Hirst, Leicester, England, assignor to The Dunlop Company Limited, London, England

Filed Oct. 15, 1969, Ser. No. 866,456
Claims priority, application Great Britain, Oct. 19, 1968, 49,697/68
Int. Cl. B61f *3/10*, *5/08*, *5/10*
U.S. Cl. 105—195 **8 Claims**



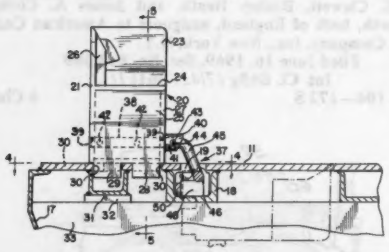
A railway vehicle having three pairs of wheels of which the axles are supported by axle boxes, and a suspension for the wheels comprising, for the axle box of each wheel of the center pair of wheels, a pair of oppositely extending equalizing beams, each beam being connected to the central axle box by means of a resilient pad located between two abutment faces associated respectively with the beam and the

central axle box, the beams extending in the longitudinal direction of the vehicle and the ends of the beams remote from the central axle box being connected respectively to the adjacent one of the axle boxes of the two other wheels on the same side of the vehicle, and rubber springs supporting the vertical load of the suspended part of the vehicle from the equalizing beams and acting to transmit the longitudinal traction and braking forces between the wheels and the suspended part of the vehicle, the rubber springs being positioned so as to distribute the vertical load of the suspended part of the vehicle in a required proportion between the wheels.

3,618,534
CONTAINER BRACKET ARRANGEMENT FOR RAILWAY CAR

Harold E. Gramse, Chicago Heights, and Bradford Johnstone, Blue Island, both of Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 8, 1969, Ser. No. 883,059
Int. Cl. B61d *45/00*
U.S. Cl. 105—366 D **9 Claims**

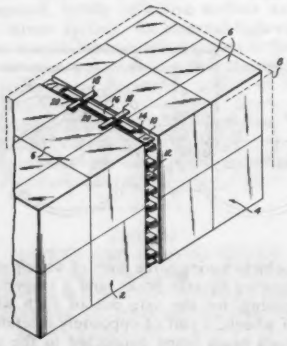


A railway car readily interchangeable for container and trailer-on-flat-car operations is provided with a container bracket arrangement having a plurality of slots in the deck of the car which permits container brackets to be longitudinally adjusted to accommodate different length containers carried by the car. The container brackets are movable into nonoperating positions within apertures which extend transversely of the slots when the car is utilized for trailer operation. The brackets are also provided with arms connected at one end with slider elements positioned in the slots and the other ends of the arms are adjustably connected to the container bracket by means of latch elements which permit the container brackets to be adjusted transversely of the slots for accommodating different width containers.

3,618,535
SUSPENDED LOAD SPACER

Ronald D. Hees, Plymouth, Mich., assignor to Narad, Inc., Wayne, Mich.

Filed July 26, 1968, Ser. No. 747,988
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 B **7 Claims**

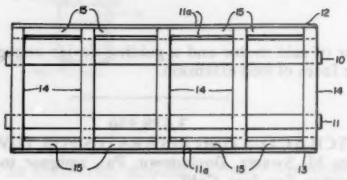


A spacer for filling spaces, in a freight shipping vehicle or container, between spaced stacks of articles of freight, and being in the form of a lightweight expandable honeycomb structure, expandable in a vertical direction in the space between stacks and suspended therein by means engaging the tops of stacked articles.

3,618,536
CRATING SYSTEM FOR SHEET MATERIAL OR THE LIKE

James W. McCracken, Leechburg, Pa.

Filed Oct. 14, 1969, Ser. No. 866,324
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **5 Claims**

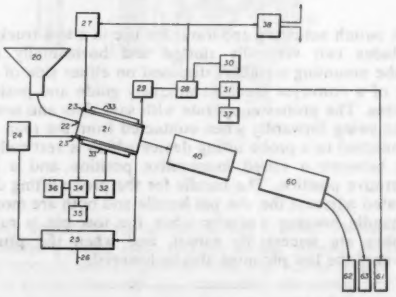


A substantially rectangular crate is provided for sheet material or the like having spaced-apart parallel bottom rails, a pair of ledge rails outside the bottom rails and parallel thereto, crosspieces extending between the ledge rails across the bottom rails and fixed thereto, support members on the ledge rails extending between the crossmembers, the tops of said crossmembers and support members being generally in the same plane. Metal bindings are inserted over the bottom rails, under the ledge rails and around a stack of sheets on the crate with a laminated paper angle between the binding and the edge of the stack.

3,618,537
SOLID WASTE DISPOSAL SYSTEM

John C. Bogue, 101 Ocean Ave., Santa Monica, Calif., and Robert I. Sarbacher, 1036 S. 1st St., Arcadia, Calif.

Filed Dec. 15, 1969, Ser. No. 884,990
Int. Cl. F23g *5/02*
U.S. Cl. 110—8 R **12 Claims**



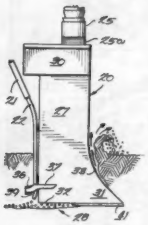
A high-temperature furnace is disclosed which is equipped with several stages in which a rotating magnetic field rotates the magnetic components of the waste material to be incinerated. Gas jets protect the combustion chambers from excessive heat and assist in the tumbling of nonmagnetic materials in the combustion chambers. Each combustion chamber is further equipped with a liquid jacket for additional cooling. The fuel injected into the combustion chambers consists in part of finely divided oxidizable metal dispersed in a liquid. Control of all components of this waste disposal system rests in a computer which monitors the overall operation of the system and adjusts the controls for optimum operating efficiency.

ERRATUM

For Class 110—14 see:
Patent No. 3,618,540

3,618,538
APPARATUS FOR APPLYING FERTILIZERS BENEATH SOIL

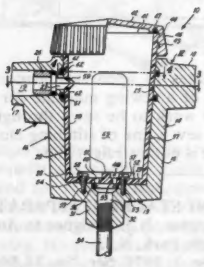
Leonard M. Brannan, 3008 Paddock Road, Omaha, Nebr.
Filed Feb. 2, 1970, Ser. No. 7,478
Int. Cl. A01c *23/02*
U.S. Cl. 111—7 2 Claims



An improved plow knife is disclosed for introducing a dry fertilizer and anhydrous ammonia in a common band at a predetermined depth beneath the surface of the soil being treated. The shank of the plow, which is generally vertical, is hollow to permit flow of dry fertilizer through it under gravity. The dry fertilizer is deposited through the heel of the knife in a band at the base of the channel cut by the knife. The toe of the plow is located forward of the leg of the shank, and the contour of the leading edge is continuously smoothly curved from the toe to a location on the shank near the surface of the soil. The entire leading edge is flat over a width of about seven-eighths of an inch, with beveled side edges so that when the plow is embedded and pulled, a ribbon of dirt is forced upwardly along the smoothly curved, flat surface and above the soil level in a rolling, upward and forward motion to remove any debris such as corn stalks and husks from the soil above the surface where it is readily discarded from the knife and does not interfere with operation. A conduit for liquid ammonia is affixed to the back of the blade and side moldboards are located at the side of the shank to gather dirt from the sides of the channel and move it over the band of ammoniated fertilizer.

3,618,539
DEVICE FOR SUPPLYING PLANT FOOD TO PLANT ROOTS

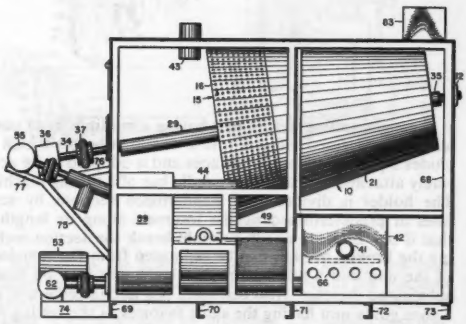
Jay S. Daniels, 5901 Crown Lane, Des Moines, Iowa
Filed Jan. 19, 1970, Ser. No. 3,722
Int. Cl. A01c *23/02*
U.S. Cl. 111—7.4 3 Claims



The plant root feeding device includes a body structure for receiving a cup-shaped container for a water-soluable plant food. The container is yieldably mounted in and secured to the body structure with an open end projected outwardly from the body structure and closed by a fluidtight cover. The container has an inlet opening adjacent the upper end of its sidewall and an outlet in the bottom wall thereof. The inlet opening is in fluid registration with a controlled water passage means in the body structure and is of a configuration to direct water circumferentially about the container for a spiral flow about the plant food and through the outlet into a ground-inserting nozzle that is attached to the body structure.

3,618,540
INTEGRATED WASTE-CONVERSION EQUIPMENT

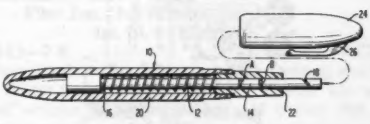
Harvey M. Wenger, and Norman E. Archer, both of Holland, Mich., assignors to Wals, Inc.
Filed Mar. 16, 1970, Ser. No. 19,609
Int. Cl. F23g *5/06*
U.S. Cl. 110—14 6 Claims



A machine for converting waste material. The machine includes a drier with provision for burning the gaseous discharge produced by the drying process. Dried and partially dried material is recirculated in a rotative drum subject to heat to maintain a workable consistency in the material. Some of the dried material is utilized as fuel, or is otherwise reduced to ashes.

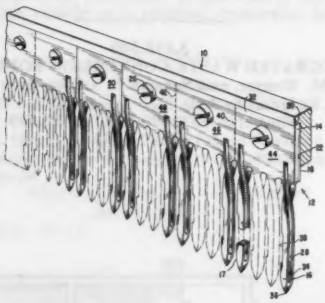
3,618,541
METHOD OF TENSIONING THREAD ON A SEWING MACHINE

Arthur E. Shryock, 1415 Amelia Ave., Findlay, Ohio
Filed Oct. 13, 1969, Ser. No. 867,119
Int. Cl. D05b
U.S. Cl. 112—1 5 Claims



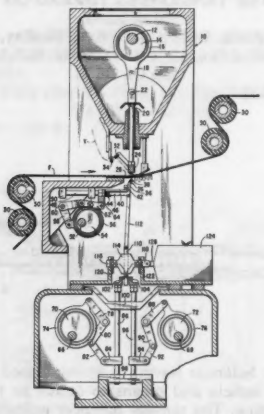
A tension balancer having a spring-biased indicator with appropriate indicia and means to attach to the thread of a sewing machine. The tension balancer permits the exact adjustment of the proper balance of tension between the needle thread and bobbin thread to provide a perfect stitch. The method of using the tension balancer requires the operator to attach the spring-biased plunger in turn to either the bobbin thread or the needle thread and kinematically adjust the sewing machine to provide the appropriate dynamic tension.

3,618,542
MULTINEEDLE UNIT
Josef Zocher, Haaren, Aachen, Germany, assignor to The Singer Company, New York, N.Y.
Filed Mar. 20, 1970, Ser. No. 21,332
Int. Cl. D05c *15/10*; D05b *85/00*
U.S. Cl. 112—79 R 23 Claims



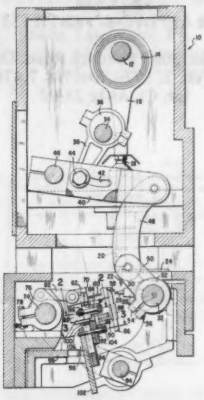
A ganged tufting needle unit having a multiplicity of parallel needles formed integral with a common holder which includes a pair of reference surfaces and is adopted to be accurately attached as a unit to a needle bar of a tufting machine. The holder is divided into standardized sections by score lines at predetermined needle intervals along its length so that if one or more needles should break the section including the broken needles can be separated from the remainder of the unit and a standard replacement unit may be readily substituted therefor. Also disclosed is a latch needle unit and a yarn guide unit having the same features as the tufting needle unit. A method for manufacturing the different units from a metal strip comprising a series of die pressing, punching and grinding steps is described.

3,618,543
PATTERN MECHANISM FOR TUFTING MACHINES
Bernard H. Wittler, Rossville, Ga., assignor to The Singer Company, New York, N.Y.
Filed July 27, 1970, Ser. No. 58,426
Int. Cl. D05c *15/22*
U.S. Cl. 112—79 A 6 Claims



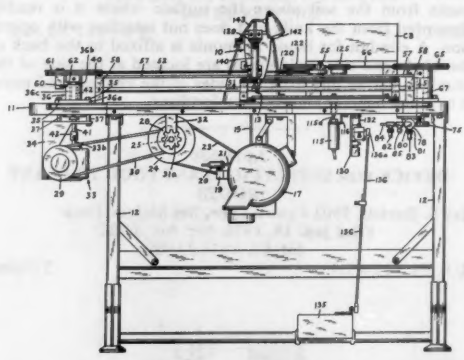
This disclosure relates to tufting machines and, in particular, to tufting machines for producing high-low-pattern pile fabrics and includes a looper means for selectively forming the length of the pile loops and selector means for initiating selective movement of the looper means.

3,618,544
CONVERTIBLE TUFTING MACHINES
Charles W. Watkins, Soddy, Tenn., assignor to The Singer Company, New York, N.Y.
Filed Nov. 3, 1970, Ser. No. 86,415
Int. Cl. D05c *15/22*
U.S. Cl. 112—79 R 9 Claims



A convertible tufting machine for producing long-nap or shag-type pile fabrics of varying length or for producing pile heights of standard or conventional pile heights including an adjustable, transfer-type looper mechanism for producing the shag pile tufted fabrics and which can be adjusted for operation as a standard tufting machine.

3,618,545
SEWING MACHINE FOR AUTOMATIC CONTOUR STITCHING
Robert L. Kosrow, Hoffman Estates, Ill., assignor to Union Special Machine Company, Chicago, Ill.
Filed Aug. 14, 1969, Ser. No. 850,189
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 18 Claims

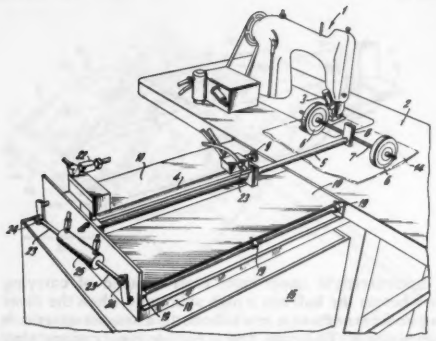


This invention relates to apparatus associated with the stitching mechanism of a sewing machine for automatically feeding the fabric or work to be sewn through the stitching zone in a manner to sew a line of stitching along a predetermined contour which is not a straight line.

3,618,546
GARMENT STACKING APPARATUS
Harold Preston, Irvington, N.J., assignor to Automated Components, Inc., Roselle Park, N.J.
Filed Apr. 1, 1970, Ser. No. 24,563
Int. Cl. D05b *33/00*
U.S. Cl. 112—121.29 2 Claims

This disclosure describes an apparatus for removing garments from a sewing machine after the sewing operation has been completed and stacking the garments thus removed in a

predetermined place. Once the garment passes the sewing portion of the sewing machine, a sensor may be provided to activate means to remove the garment from the sewing machine and which also may activate means to sever the



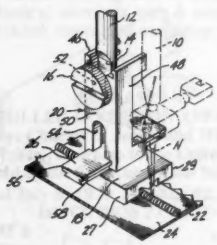
thread. The garment is then brought onto a pair of doors which when opened allow the garment to fall through and be deposited in a stack which can then be conveniently moved for further operations.

3,618,547

ZIPPER FOOT ATTACHMENTS

Robert B. Howell, 2115 Madrona Point Drive, Bremerton, Wash.

Continuation-in-part of application Ser. No. 764,453, Oct. 2, 1968, and a continuation-in-part of 764,518, Oct. 2, 1968, and a continuation-in-part of 678,742, Oct. 27, 1967, now Patent No. 3,473,498, dated Oct. 21, 1969, which is a continuation-in-part of application Ser. No. 501,066, Oct. 22, 1965, now Patent No. 3,349,736, dated Oct. 31, 1967, which is a continuation-in-part of application Ser. No. 975,486, July 28, 1965, now Patent No. 3,342,151, dated Sept. 19, 1967.
This application Oct. 27, 1969, Ser. No. 869,836
Int. Cl. D05b *29/12*
U.S. Cl. 112—240 **6 Claims**



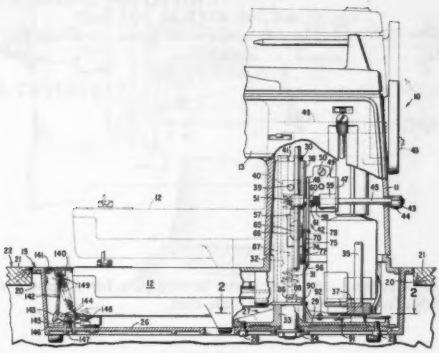
The foot component has a front end which is spaced rearwardly of the needle. Channellike guide means are provided at such front end for twisting the zipper teeth as they pass therethrough into an attitude which will result in the zipper teeth adjacent the needle being properly oriented for close-to-the-teeth sewing. No pressure is applied to the zipper tape in the region of the needle. This enables the operator to exert a slight amount of tension on the zipper tape and the material to which it is being sewn, in opposition to the pressure forces of the foot and the advancing force of the advancing mechanism, for maintaining the tape and material substantially straight while it is being sewn.

3,618,548

MULTIPLE HEIGHT-ADJUSTING MECHANISMS FOR TUBULAR-BED-SEWING MACHINES

Russell A. Fritts, Phoenix, Md., assignor to The Singer Company, New York, N.Y.

Filed Apr. 10, 1970, Ser. No. 27,279
Int. Cl. D05b *75/00*
U.S. Cl. 112—258 **5 Claims**



A mechanism for raising or lowering a sewing machine relatively to a support base selectively to orient the machine for sewing tubular or flat work. Adjustment of the machine elevation is accomplished by providing a manually operable lifting mechanism that resiliently supports the sewing machine in an elevated position. The mechanism includes a lift spring disposed in a vertical tubular member secured to the support base for operably coacting in a controllable manner with a mating sleeve secured to the sewing machine frame thereby permitting the operator to place the machine in the desired sewing position. One form of manual control of the lifting mechanism includes a manually influenced locking finger carried on one of the mating parts for register with any one of a plurality of discrete elevations. Another form disclosed provides a friction shoe to permit selection of an infinite variety of selected sewing machine levels. Also disclosed is a hinged auxiliary work support which extends the work-supporting surface in the sewing machine elevation for sewing flat work and which is automatically lowered when the sewing machine is shifted into an elevation for facilitating the sewing of tubular articles.

3,618,549

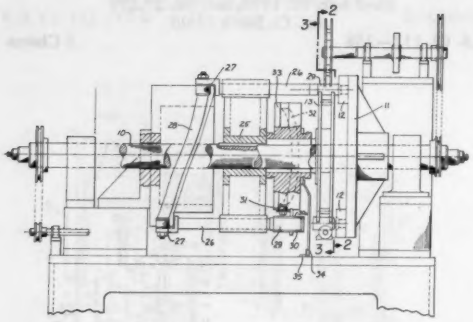
REROUNDING MECHANISM FOR A ROTARY DOMER

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jan. 19, 1970, Ser. No. 3,737
Int. Cl. B21d *51/26*
U.S. Cl. 113—7 R **7 Claims**

A conventional rotary domer, or base-forming machine, having a spider for carrying a number of female dies and a number of articles to be formed by said female dies, said spider being secured to a shaft, and a male die-carrying spider also secured to said shaft and having one die for each female die being carried by said first-named spider, and having means for reciprocating the respective male dies during a partial revolution of the shaft, is provided with a bushing telescopingly embracing each male die, and separate means for reciprocating said bushings. The separate means is arranged to advance each bushing before the respective male die advances, to reround the article to be formed and to align it properly with the respective male and female dies. The several bushings may be retracted after the respective male dies have entered the respective articles and before the respective males have completed their advance, or they may

be retracted concurrently with the respective male dies, or they may be retracted after the respective male dies have



been retracted, and thus serve as strippers for stripping the articles from the respective male dies.

3,618,550

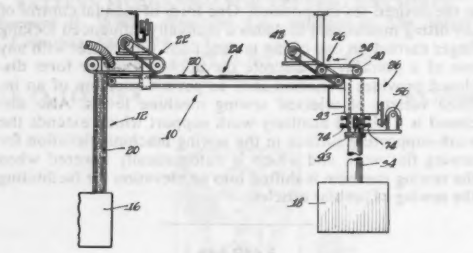
METHOD AND APPARATUS FOR CONTROLLING THE SUPPLY IN A CAN END PROCESSING SYSTEM

Wallace W. Mojden, Palos Heights, and Norman J. Chivas, Naperville, both of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Continuation-in-part of application Ser. No. 825,096, Apr. 16, 1969, now Patent No. 3,545,631, which is a continuation-in-part of application Ser. No. 703,303, Feb. 6, 1968, now abandoned. This application Jan. 26, 1970, Ser. No. 5,540

Int. Cl. B21d *43/16*

U.S. Cl. 113—113 C **20 Claims**



Control apparatus for use in a can end handling system of the general type having one or more pair of successive work stations, each provided by a first and a second can end processing machine, with said machines being linked by conveyor means of the type including a trough through which a continuous stream of can ends are supplied from one machine to the other. The trough includes a vertically disposed section at which point said apparatus operates. The control apparatus includes means to engage and retard the flow of can ends through said trough in order to produce a gap in said continuous stream. Associated with the trough in the area of said gap, there are provided monitoring means for detecting the level of the can ends in said gap. Said monitoring means include first and second sensing units which detect the level of can ends at axially spaced locations in said gap, and adjust the output of said first machine and the rate of consumption of said second machine so that neither an oversupply, nor an undersupply of can ends of said second machine occurs.

3,618,551

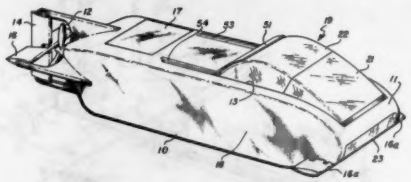
DUAL POSITION CANOPY FOR UNDERWATER CRAFTS

John M. Deslierres, Rolling Hills, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 7, 1969, Ser. No. 864,429

Int. Cl. B63g *8/00*

U.S. Cl. 114—16 A **4 Claims**



A nonwatertight underwater craft capable of carrying a diver wherein the hull has a high silhouette when the diver is sitting and converts to a low silhouette when the diver is in a prone position. The craft has a bubble type canopy that is positioned in an opening on the upper deck. The canopy is hinged connected at its forward end and the diver can rotate the canopy downward into the hull. Behind the canopy is mounted a closure plate that is hinged at its aft end to the hull allowing the plate to rotate forward to a horizontal position whenever the canopy is lowered to close the opening and thereby optimize the streamlining and minimize drag when the canopy is lowered.

This invention relates to an underwater craft and, more particularly, to small nonwatertight and flooded underwater crafts that are capable of carrying at least one diver in a wet suit with air tanks and breathing apparatus.

3,618,552

VEHICLE ADAPTED TO BE SUPPORTED BY A CUSHION OF FLUID

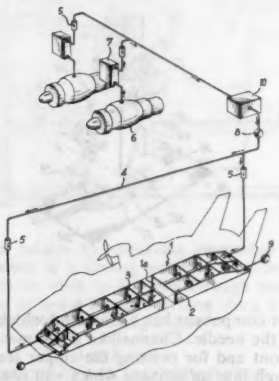
Andre Grihangne, Paris, France, assignor to Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres et Amphibies S.E.D. M., Paris, France

Filed Nov. 29, 1968, Ser. No. 780,011

Claims priority, application France, Dec. 5, 1967, 130,975

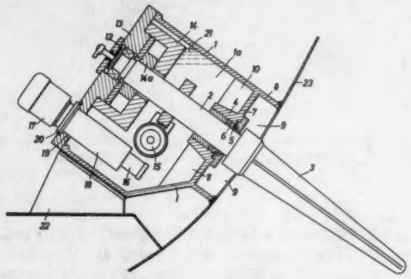
Int. Cl. B63b *1/38*

U.S. Cl. 114—67 A **6 Claims**



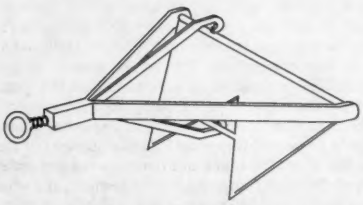
A vehicle adapted to be supported by a cushion of fluid, particularly air, and having incorporated therein a plurality of chambers or buoyancy tanks adapted to be filled with a gas under pressure and means for filling the chambers with such gas in order to render the vehicle buoyant.

3,618,553
DRIVING SYSTEM FOR SHIPS STABILIZERS
Heinz-Gunter Ehluss, Tornesch Holstein, Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft, Hamburg Und Kiel, Hamburg, Germany
Filed Jan. 9, 1970, Ser. No. 1,641
Int. Cl. B63b *39/06, 43/06*
U.S. Cl. 114—126 5 Claims



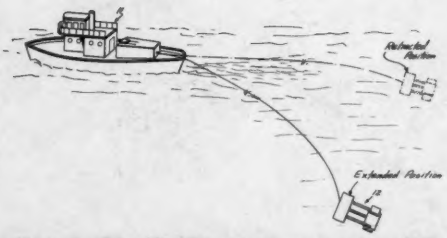
An hydraulic-driving system for a nonretractable fin of a ships' stabilizers includes a housing joined to the inside of the ship's hull with bearings for the fin shaft and hydraulic-driving means. The housing includes a space for a charge of hydraulic oil and the housing wall facing the fin is arranged to be bathed by sea water so as to cool the oil.

3,618,554
BOAT- OR SHIP-TYPE ANCHOR
Lowell Lloyd Patten, 2360 E. 21st South St., Salt Lake City, Utah
Filed June 16, 1969, Ser. No. 833,819
Int. Cl. B63b *21/40*
U.S. Cl. 114—208 R 1 Claim



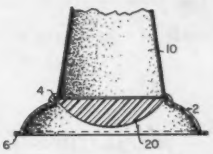
A fluke-type marine-mooring anchor is disclosed as assembled from mechanical elements with a means of quick conversion from a folded, restrained condition to an open, working condition.

3,618,555
CONTROLLED DIVERSION APPARATUS
Raymond E. Kelly; Charles B. Jones, and William P. Frost, all of Panama City, Fla., assignees to the United States of America as represented by the Secretary of the Navy
Filed July 6, 1970, Ser. No. 52,350
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 B 10 Claims



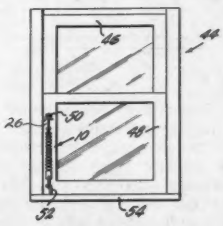
A hydrodynamic tow system is disclosed as including a tow cable means with a selectively positioned diverter mechanism at the distal end thereof. The diverter mechanism includes a movable control surface thereon and an actuation mechanism therefor which is connected to said tow cable and is responsive to tensional variations therein to move said control surface.

3,618,556
TRAFFIC CONES AS SAFETY DEVICES IN ROAD TRAFFIC
Erich Dittrich, Bremen, Germany, assignor to Titan Plastics Corporation, New York, N.Y.
Filed Apr. 14, 1970, Ser. No. 28,384
Claims priority, application Germany, Apr. 24, 1969, G 69 17 029.2
Int. Cl. E01f *9/10*
U.S. Cl. 116—63 P 7 Claims



A traffic cone is made up of a base piece and an inflatable flexible toppiece which is attached to the base and can be inflated to the shape of a cone, the toppiece being made of luminescent or reflective material for use as a safety device in road traffic.

3,618,557
SELF-ENERGIZING BURGLAR ALARM
Henry H. Merriman, 751 W. Washington, Jackson, Mich.
Filed Nov. 12, 1969, Ser. No. 875,874
Int. Cl. G08b *13/08*
U.S. Cl. 116—86 5 Claims

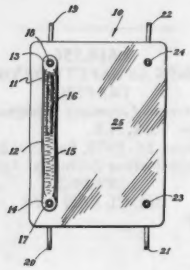


A self-energizing alarm, particularly suitable as a burglar alarm, consisting of an elongated flexible bellows having attachment means at each end, and an audible signal-producing reed communicating with the interior of the bellows. The opposite ends of the alarm are connected to window, door structure, or the like, having relative movable components whereby movement of these components produces extension of the bellows and an audible signal. In an embodiment of the invention the bellows are preformed to intermittently operate with a snap action to produce an intermittent signal.

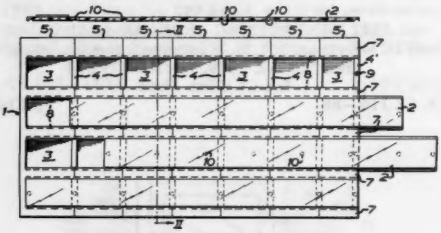
3,618,558
UNSAFE CONDITION INDICATOR FOR FROZEN FOOD CHESTS
Barry Tepfer, 19 Milburn St., Rockville Center, N.Y.
Filed May 1, 1970, Ser. No. 33,782
Int. Cl. G01k *1/02*
U.S. Cl. 116—114.5 1 Claim

A card having mounted thereon a transparent waterproof tube containing a liquid solution and a short indicator rod. The card is placed in a freezing unit until the liquid, with the

rod within it, freezes. The card is then inverted in the freezer unit. When the temperature of the unit rises above the melting point of the liquid, the indicator rod will fall indicating an unsafe condition.



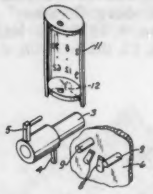
3,618,559
DISPENSER PREFERABLY FOR MEDICAL PREPARATIONS
Kjell Moe, Stocksund, Sweden, assignor to Eneqvist & Holme Farmacevtiska AB, Stockholm, Sweden
Division of Ser. No. 793,047, Jan. 22, 1969, abandoned. Filed May 20, 1970, Ser. No. 38,944
Int. Cl. G09f 9/00
U.S. Cl. 116—121 **4 Claims**



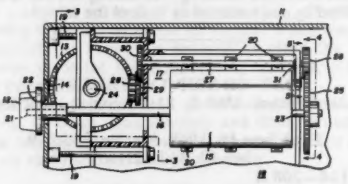
A dispenser for medical preparations has a body with several spaces or compartments therein, and at least one cover which is movable stepwise relative to the dispenser body so that the spaces or compartments which are delimited from each other are uncovered one after the other. The dispenser which can be replenished time and again with doses of medical preparations has time indications at each space or compartment and a holder for a card showing the prescribed dosage.

3,618,560
SWITCH/INDICATOR ACTUATOR ASSEMBLY
Masatsugu Aoki, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed May 20, 1970, Ser. No. 38,970
Claims priority, application Japan, May 29, 1969, 44/49802
Int. Cl. H03j 1/02
U.S. Cl. 116—124.1 **12 Claims**

An actuator for a switch and/or indicator comprises a shaft rotatably passing through a wall and having a flexible nodal switching arm attached thereto, the shaft being operatively connected to a switch and/or indicator or the like. The wall through which the shaft passes is provided with a plurality of spaced nodes projecting therefrom into the path of movement of the nodal switching arm past which said nodal arm can move as a result of the bending of said arm, and is further provided with stop members engageable with said arm beyond said nodes. The construction is exceptionally well adapted for use in a multiband tuning device provided with a tuning shaft, the shaft of this assembly being rotatably mounted on the tuning shaft and being operatively connected both to a band-selection switch and to an indicator.

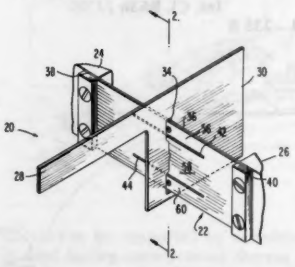


3,618,561
TUNER ASSEMBLY FOR A TELEVISION RECEIVER
Robert J. Wallis, Syracuse, and Clinton O. Woodard, Jr., Clay, both of N.Y., assignors to General Electric Company
Filed Mar. 21, 1969, Ser. No. 809,192
Int. Cl. H03j 1/02
U.S. Cl. 116—124.1 **3 Claims**



An improvement in a channel tuner assembly for a television receiver of the type including a tuner having a rotary channel selector shaft interconnected by drive train means to a channel indicator member. The improvement comprises providing yieldable means, such as a spring or the like, adjacent the drive train means to normally urge driving engagement between the indicator member and the tuner shaft, but being yieldable to permit temporary disengagement of the indicator member from the tuner shaft and movement independently thereof. With this improved arrangement, the channel indicator member can be more easily calibrated with the tuner than has previously been possible.

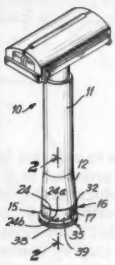
3,618,562
PIVOTAL MOUNTING
Virgil Erbert, Albuquerque, N. Mex., assignor to Rolamite, Incorporated, San Francisco, Calif.
Filed June 9, 1970, Ser. No. 44,743
Int. Cl. G01d 13/22
U.S. Cl. 116—136.5 **16 Claims**



A pointer mounting arrangement including a support formed from a thin resilient sheet member pivotally con-

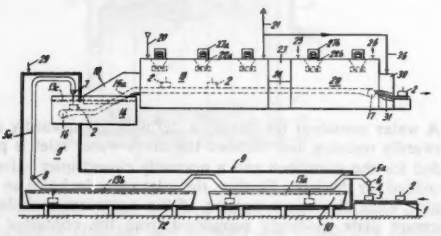
nected with a thin sheet pointer member. The thin sheet pointer is provided with an aperture or notches in a portion thereof for pivotal connection with corresponding portions in the thin sheet support member to provide a sensitive, accurate, rugged, inexpensive and easily manufactured precision mounting arrangement.

3,618,563
MANUAL TALLY DEVICE
Michael B. Singer, 1150 Park Ave., New York, N.Y.
Filed Jan. 15, 1970, Ser. No. 3,187
Int. Cl. G09f 9/00
U.S. Cl. 116—133 **18 Claims**



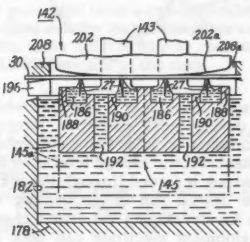
This device is for manually tallying the number of times an occurrence happens or some operation is accomplished. The device comprises an assembly of two relatively coaxially slidable and rotatable parts having complementary rotated means and being biased together axially by magnetic means. One use of such an assembly is to tally the number of shaves obtained with one blade of a safety razor.

3,618,564
DEVICE FOR THE CONTINUOUS PRODUCTION OF LEAD PLATES FOR STORAGE BATTERIES
Horst Herne Dungs; Otto Jache; Gunter Piske; Karl-Heinz Landfried, and Karl-Heinz Knak, all of Budingen, Germany, assignors to Firma Carl Still, Recklinghausen, Germany
Filed Nov. 3, 1969, Ser. No. 873,427
Claims priority, application Germany, Nov. 2, 1968, P 18 06 588.8
Int. Cl. B05c 11/00
U.S. Cl. 118—66 **8 Claims**



A device for the continuous production of lead plates for storage batteries includes a conveyor for moving the plates within a cabinet through a series of treatment containers and chambers including a washing tub, an impregnation tub, a drying chamber and a cooling chamber. The materials are treated in the drying and cooling chambers with an inert gas atmosphere and the plates are moved through these chambers while they are hanging or standing on hangers or arranged in a vertical position within the cabinets. The dryer for the negative plates has an inlet portion with a receiving opening or orifice which is immersed below the surface of the fluid of one of the washing or impregnation tubs to provide a sealing of this chamber against the escape of the inert gas. The cooling chamber and the drying chamber are located directly adjacent one another but separated by an air lock permitting passage of the plates or the cabinets containing them through the lock with automatic sealing. Preferably at the outlet of the drying chamber or cooling chamber an air lock is installed which is provided with baffle doors which are openable by contact of the cabinets therewith. The air lock chamber is provided with means for directing an inert gas into the chamber and for delivering the gas from the chamber. The outlet door is located so that it is hinged with its top edge at a level lower than the bottom edge of the inlet door to the chamber. The individual drying and cooling chambers employ the same inert gas for heating and cooling purposes, the gas being delivered in a closed cycle through heat exchangers which operate upon the gas to provide the desired temperature for the respective cooling and drying chambers.

3,618,565
APPARATUS FOR DIPPING INTRACUTANEOUS INJECTORS
Arthur S. Taylor, Spring Valley, and Ellsworth R. Sandhage, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 641,639, May 26, 1967, Pat. No. 3,246,647. Filed Sept. 16, 1969, Ser. No. 871,047
Int. Cl. B05c 3/02
U.S. Cl. 118—421 **4 Claims**

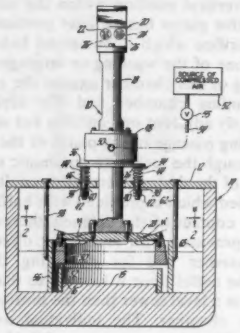


A coating device includes a dipper having an annular bath section having a recessed inner wall which defines a drain opening. Means reciprocate the dipper between a charging location within a reservoir and an elevated applying station.

3,618,566
APPARATUS FOR METAL WETTING LINERS
James B. Walker, Almont, and Raymond S. Amala, Oak Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 450,043, Apr. 22, 1965, Pat. No. 3,505,103. Filed Aug. 27, 1969, Ser. No. 853,296
Int. Cl. B05c 3/05
U.S. Cl. 118—429 **7 Claims**

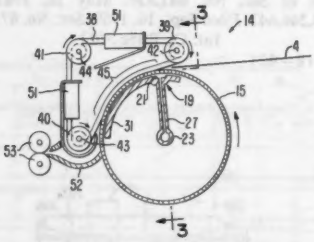
A sonic vibratory apparatus for wetting the outer surface of a ferrous metal article located in a bath of molten nonferrous metal, and including an elongated bar, one end of which supports a pair of counterrotating air driven vibrators. A flexural member is carried by the other end of the bar and is

connected to a flat annular ring having a planar surface which serves as a radiator surface. A source of compressed



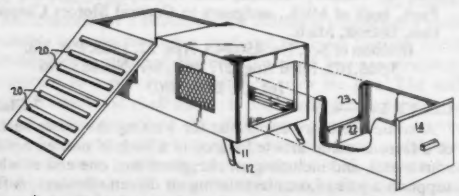
air is provided for driving the vibrators at a resonant standing wave frequency of the flexural member.

3,618,567
APPARATUS FOR DEVELOPING LATENT ELECTROGRAPHIC IMAGES WITH LIQUID INK
Raymond L. Levy, Santa Clara, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Sept. 15, 1969, Ser. No. 858,044
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **6 Claims**



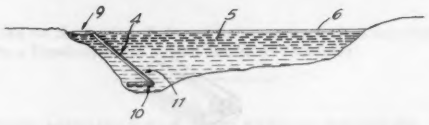
An electrographic developer is disclosed which includes an ink pervious development electrode structure having a development surface over which an electrographic recording web bearing latent electric charge images to be developed is disposed. Liquid ink is forced through the ink pervious electrode structure against the image bearing surface of the recording web for developing the latent charge image pattern. The development electrode can take the form of a plate, a roller or a continuous belt. In the case of the continuous belt or roller, ink is forced through the ink pervious electrode structure from the inside and the recording web is pressed into engagement with the outer surface of the electrode structure.

3,618,568
PET HOUSE
Earl W. Breeden, 832 Grayson Ave., Waynesboro, Va.
Filed Mar. 6, 1970, Ser. No. 17,224
Int. Cl. A01k *01/00, 67/00*
U.S. Cl. 119—19 **5 Claims**



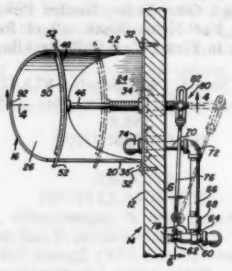
Pet house in the form of an attractive piece of furniture which can be readily opened to a pet house usable in a person's living quarters.

3,618,569
DEVICE FOR TRANSFERRING HEAT FROM ONE PORTION OF A WATER RESERVOIR TO ANOTHER
Stephen C. Baer, P.O. Box 445, Corrales, N. Mex.
Filed July 17, 1969, Ser. No. 852,959
Int. Cl. A01k *7/00*
U.S. Cl. 119—73 **1 Claim**



This invention relates to a device for melting surface ice on a water tank and in particular to a device for maintaining water tanks, such as stock tanks, ice free during the cold months. The device consists of a continuous loop having a hollow interior and filled with volatile liquid which can be circulated through the loop by convection. The loop has two enlarged ends being connected together by a straight portion which is insulated to prevent heat loss in transferring the heat-conveying liquid from one end of the loop to the other.

3,618,570
AUTOMATIC ANIMAL WATERING DEVICE
Procopio M. Chavez, 102 Camino Dos S.W., Albuquerque, N. Mex.
Filed Dec. 4, 1969, Ser. No. 882,191
Int. Cl. A01k *07/00*
U.S. Cl. 119—75 **11 Claims**

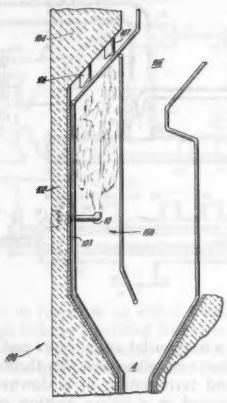


A water container for livestock defining an upwardly and forwardly opening and inclined throat. A water inlet is provided for the container and a normally closed inlet valve is provided for the inlet. Further, the inlet valve includes an actuator while the upper portion of the container includes a pressure plate guidingly supported from the container for horizontal shifting forward toward and rearward away from the forward upper marginal edge of the throat. Means is provided yieldingly urging the pressure plate toward a forwardmost limit position spaced rearwardly from the forward edge of the throat and motion transmitting means is operatively connected between the pressure plate and the actuator for opening the valve in response to rearward movement of the pressure pad from its forward limit position as a livestock animal inserts his snout or nose down into the forwardly and upwardly inclined throat of the container.

3,618,571
PROCESS AND APPARATUS FOR BURNING SULPHITE LIQUOR

Karl-Heinz Wirths, Munich, Germany, assignor to L & C Steinmuller G.m.b.H., Gummersbach, Germany

Filed Mar. 13, 1970, Ser. No. 19,309
Int. Cl. F22b 1/18
U.S. Cl. 122—7 C 6 Claims

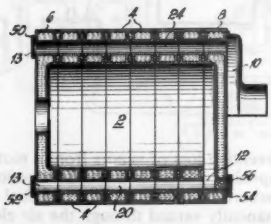


Sulphite liquor, for example, magnesium bisulphite liquor is burned in a combustion chamber which forms part of a steam generator. The burning of the liquor is accomplished at pressures of between 5 to 25 atmospheres excess pressure and at a temperature of about between 80° and 100° C. The combustion chamber should preferably have constant height dimensions with a depth of at least 1.5 and at the most 5 meters. The combustion chamber is charged in quantities so as to correspond to a specific cross sectional load of between 3×10^6 to 5×10^6 kcal./m.²h.

3,618,572
SECTIONAL BOILER

Kurt Erich Nauert, Walldorf, Germany, assignor to Strebelwerk, G.m.b.H., Manheim, Germany

Filed Nov. 7, 1969, Ser. No. 874,832
Claims priority, application Germany, Nov. 15, 1968, P 18 09 073.8
Int. Cl. F22b 7/12
U.S. Cl. 122—225 R 3 Claims

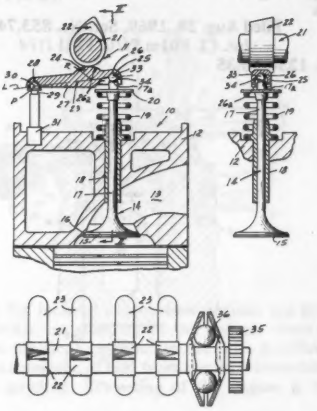


A sectional boiler burning fluid fuels comprises a core combustion chamber and forward and return flue passages forming concentric jackets surrounding the combustion chamber. The flue passages are interconnected only in the front section of the boiler and are radially bounded by inner and outer concentrically arranged water compartments which are connected to forward and return flow connecting pipes. The respective flue passages are separated from each other by radial passages which connect the water compartments. Baffles are positioned in the flue passages to further increase the heat transfer transmission therein.

3,618,573
VARIABLE CAM AND FOLLOWER ASSEMBLY

Clifford H. Allen, Chesterland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 28, 1969, Ser. No. 828,474
Int. Cl. F01l 1/34, 1/18
U.S. Cl. 123—90.18 5 Claims

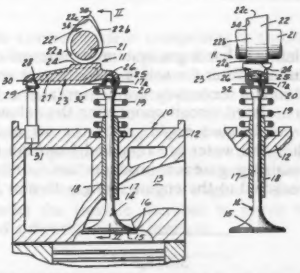


An adjustable cam and follower assembly effective to vary timing, amount of lift and duration of lift of engine valves and the like wherein the cam has an axially and radially varying contour and the follower has a large radius cam-contacting surface. The cam contour is generated by a grinding wheel of equal radius to the cam follower radius. The cam follower is free to tilt on said contour and maintain straight or curved line contact throughout the entire range of adjustment of the assembly. The cam contour extends across a wide axial plane while the cam follower surface is cylindrical with its surface generated from a centerline, and is free to tilt about a longitudinal axis for maintaining line contact with the cam while at the same time is free to rock about a second axis to follow the lift function of the cam.

3,618,574
VARIABLE CAM AND FOLLOWER ASSEMBLY

Merlin J. Miller, Cleveland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 28, 1969, Ser. No. 819,627
Int. Cl. F01l 1/34, 1/18
U.S. Cl. 123—90.18 7 Claims



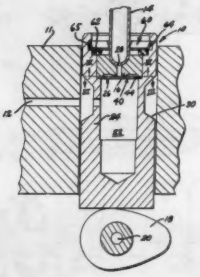
An adjustable cam and follower assembly capable of varying cam timing, amount of lift and duration of lift wherein the cam has an axially and radially varying contour and the follower has the a flat cam engaging face free to rock and maintain line contact with the cam contour throughout its entire range of adjustment. The assembly is particularly useful in operating internal combustion engine poppet valves where it can be made sensitive to engine speed to achieve op-

timum flow of exhaust and intake for each engine condition thereby minimizing pollutants in engine exhaust and preventing dilution of fuel intake with residues.

3,618,575
METERING MECHANICAL TAPPET

David L. Coates, and Ronald R. Erickson, both of Muskegon, Mich., assignors to Johnson Products, Inc., Muskegon, Mich.

Filed Aug. 28, 1969, Ser. No. 853,741
Int. Cl. F01m 9/10; F01l 1/14
U.S. Cl. 123—90.35 **6 Claims**

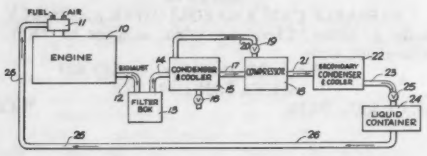


A mechanical tappet utilizing a precision metering of oil from a reservoir to the pushrod seat through a disc on which the seat sits. The seat is permanently maintained in engagement with the disc by means of an O-ring held against the seat by a snap-in annular ring. Because of the resilience of the O-ring, it is possible for the seat to rotate with respect to the disc even though no axial separation is possible.

3,618,576
RECIRCULATING EXHAUST GAS SYSTEM FOR INTERNAL COMBUSTION ENGINES

Paul F. Dixon, 1601 Chattanooga Ave., Youngstown, Ohio

Filed May 18, 1970, Ser. No. 38,103
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A **5 Claims**



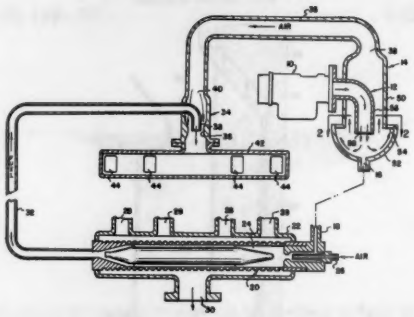
A recirculating exhaust gas system for internal combustion engines includes a filter for solids, a condenser and cooler, a compressor and a secondary condenser and a liquid container, all in a closed circuit connecting the exhaust outlet of an internal combustion engine with the air and fuel inlet thereof. Solids and water are removed from the exhaust gas and the remaining gaseous products are condensed to a liquid and recycled to the engine along with new fuel and air supplies.

3,618,577
SEPARATOR FOR FUEL-AIR INDUCTION SYSTEM

Norman T. Shaw, La Mesa, Calif., and William A. Engstrom, North Muskegon, Mich., assignors to Continental Motors Corporation, Muskegon, Mich.

Filed Apr. 11, 1968, Ser. No. 720,589
Int. Cl. F02m 31/00, 33/00
U.S. Cl. 123—122 AC **2 Claims**

A separator for a specialized fuel-air induction system in which a fuel-air mixture formed in a standard carburetor is introduced into the separator to remove substantially all the air from the fuel, the separated fuel then being directed to a retort heat exchanger arranged within the exhaust manifold of the internal combustion engine to dry-vaporize the fuel, which is then remixed with the air conducted from the separator and introduced into the cylinder intake ports of the engine, the improved separator comprising a housing having a vertical cylindrical chamber provided with an air outlet at

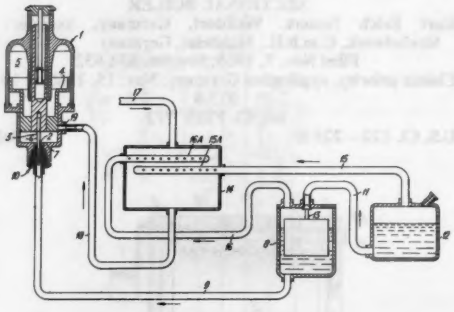


its upper end and a fuel outlet at its lower end, with a fuel-air mixture inlet conduit extending inwardly through the sidewall of the housing and terminating in a downwardly directed inlet opening disposed in a lower portion of the chamber hemispherically formed for improved separation of the fuel and air, and the inlet conduit being adapted for connection to a carburetor disposed laterally of the separator housing.

3,618,578
MOTOR VEHICLE FUEL SYSTEMS

Peter P. Swatman, Olton, Solihull, and Peter G. G. Knight, Allesley, Coventry, both of England, assignors to The British Motor Corporation Limited, Birmingham, England

Filed Aug. 1, 1969, Ser. No. 846,776
Int. Cl. F02m 25/00
U.S. Cl. 123—136 **3 Claims**



System for preventing loss of vapors from a motor vehicle fuel system comprising a filter bed and connections to said bed from the carburetor float chamber and fuel tank, said filter being permanently vented through the air cleaner, and vented to the choke region of the carburetor whenever the engine is delivering more than a predetermined amount of power.

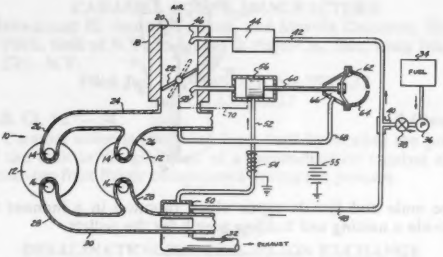
3,618,579
AUXILIARY FUEL DELIVERY SYSTEM

Robert E. Varran, 3430 Prospect Road, Ypsilanti, Mich.

Filed June 11, 1969, Ser. No. 832,336
Int. Cl. F02m 31/00, 13/04
U.S. Cl. 123—127 **4 Claims**

An auxiliary fuel delivery system for an internal combustion engine in which an auxiliary fuel delivery conduit

conducts fuel in heat exchange relation with the exhaust manifold of the engine and then through an electrical heating coil where the fuel is heated to the vapor point and is delivered to a valve controlled by a diaphragm device which



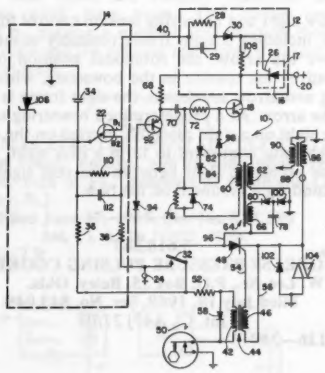
opens the valve in response to either intake manifold pressures, or through linkage operated from the throttle valve, at high-power engine requirements and thereby injects the heated fuel into the intake manifold downstream of the throttle valve.

3,618,580

OVERVOLTAGE AND ELECTRONIC RELAY CIRCUIT FOR CAPACITOR DISCHARGE IGNITION SYSTEMS

Peter Dogadko, and Forbes D. Gilchrist, both of Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 17, 1969, Ser. No. 885,683
Int. Cl. F02p 3/06
U.S. Cl. 123—148 E **9 Claims**



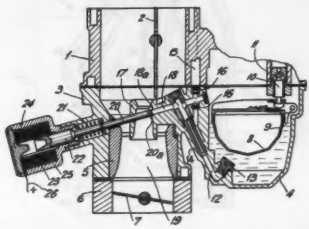
An energy-pulsing circuit is provided for reestablishing a predetermined energy level within a storage capacitor after the energy therefrom has been applied to the ignition coil in response to external pulse signal information. A power-switching circuit is connected between the energy-pulsing circuit and an external power supply to block current flow to the energy-pulsing circuit during one instance, and to provide a current path to the energy-pulsing circuit during another instance. A synchronized oscillator is provided for controlling current flow through the power-switching circuit during desired periods of time, the oscillator circuit being synchronized with the external pulse signal information.

3,618,581

CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Jocelyn Elie Louis Simonet, Paris, France, assignor to Societe Du Carburateur Zenith, Lyon, Rhone, France

Filed Aug. 29, 1969, Ser. No. 854,040
Claims priority, application France, Sept. 5, 1968, 165165
Int. Cl. F02b 77/08; F02m 3/02
U.S. Cl. 123—198 DB **1 Claim**



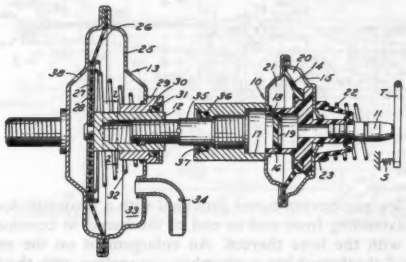
Carburetors for internal combustion engines are provided with means which, on stopping of the engine, obturate the fuel path from the float chamber to the inlet manifold, and thus prevent the passage of fuel from the float chamber while the engine is standing. Restarting of the engine is thereby facilitated.

3,618,582

THROTTLE CONTROL SYSTEM

Gordon R. Gerlitz, Flint, and George A. James, Dearborn, both of Mich., assignors to F & E Manufacturing Company, Flint, Mich.

Filed Dec. 4, 1969, Ser. No. 882,082
Int. Cl. F02b 77/00; F02d 11/08; F02m 19/12
U.S. Cl. 123—198 **8 Claims**



A throttle control system comprising a throttle member movable in response to movement of the throttle of the vehicle and a dashpot assembly mounted on an actuator of a vacuum-operated throttle control device. When the engine of the vehicle is operating, the system operates to prevent the throttle member from moving beyond a certain point toward a throttle-closing position and to prevent unduly rapid return of the throttle when the operator releases the throttle. Upon interruption of the operation of the engine of the vehicle, the system permits the throttle member to move beyond said point toward a throttle-closed position.

3,618,583

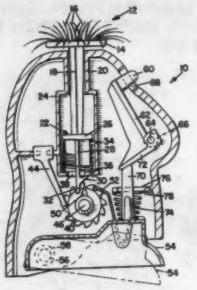
GAME APPARATUS WITH SPRING-EJECTABLE TOP

Alvin R. Pottern, Longmeadow, Mass., assignor to Milton Bradley Company, Springfield, Mass.

Filed Aug. 14, 1969, Ser. No. 850,054
Int. Cl. F41b 7/00
U.S. Cl. 124—16 **4 Claims**

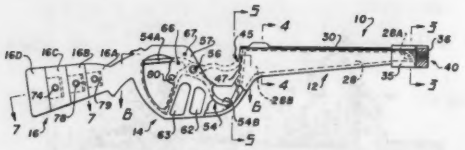
A body with a projectable top releasably disposed thereon, the top resting on a spring-loaded trigger which, when cocked, extends into the path of a rotatable cam movable

upon manipulation of the body in indexing movements in concert with a ratchet wheel, contact of the cam with the trigger uncocking the trigger so as to project the top from the



body. The cam is rotatable by a wheel. Indexing of the ratchet wheel is accomplished by a pivoted base that is located at the bottommost part of the body.

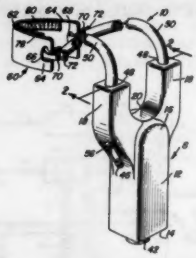
3,618,584
REPEATER-TYPE SELF-PROJECTING ELASTIC BAND GUN
Norman G. Pigeon, 778 Forest Street, Kamloops, British Columbia, Canada
Filed Apr. 23, 1970, Ser. No. 31,290
Int. Cl. F41b *7/02*
U.S. Cl. 124—19 **6 Claims**



A toy gun having barrel provided with a projectile-loading slot extending from end to end of the barrel in communication with the bore thereof. An enlargement on the muzzle end of the barrel has a chamber connecting with the bore. The breech has a plate provided with interconnected projectile storage and discharge slots. A trigger in the breech of the gun has an end member which traverses the discharge slot when said trigger is pivoted. The gun is adapted to shoot elastic projectiles which have a knob on each end thereof. One knob is lodged in the muzzle chamber and then stretched so that the other knob engages and is held by discharge slot in the breech plate, the storage slot projectiles subsequently being transferred to the discharge slot, by way of a connecting slot, for firing.

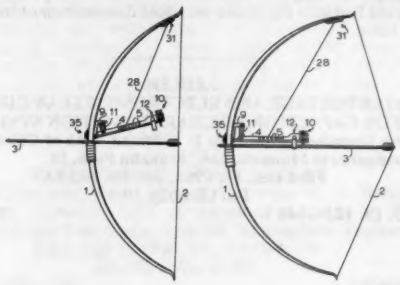
3,618,585
SLINGSHOT WITH PELLET MAGAZINE
Audie Lee Allison, 606 26th St., Snyder, Tex.
Filed Mar. 11, 1969, Ser. No. 806,147
Int. Cl. F41b *7/00*
U.S. Cl. 124—20 **5 Claims**

A slingshot embodying a novelly constructed stock and a three-part sling. The stock embodies a magazine-type handgrip having a storing chamber for a supply of ready-to-use BB's or pellets, birdshot for example. The stock also has arms with bores. The forward ends of stretchable elastic tubes are anchored in their respective bores. The rearward ends of these tubes are connected by a pliant leather or an equivalent strap or saddle which is equipped with Velcro-



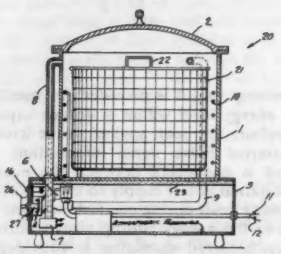
type male and female tapes which function in a manner to provide a nesting and holding pouch for the pellets.

3,618,586
ARROW SIGHT AND BOWSTRING TENSION CONTROL
George C. Current, and Susie B. Current, both of Rt. 1, Box 110A, Boyd, Tex.
Filed Nov. 3, 1969, Ser. No. 873,159
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 **5 Claims**



An arrow sight and bowstring tension control for mounting on a bow including a sight frame rotatably mounted to the bow above the arrow, the rotational position of which is determined by the tension in the bowstring, whereby as the bowstring and arrow are drawn, the sight frame is lowered to rest on the arrow. At a predetermined bowstring tension portions of a sight on a sight assembly carried on the sight frame are brought into alignment to form a rear sight, thereby allowing the archer to sight between the rear sight alignment and a second sight mounted on the bow.

3,618,587
GREASE PRESSURE-PULSING COOKER
Maurice W. Lee, Sr., P.O. Box 25, Boley, Okla.
Filed July 18, 1969, Ser. No. 843,049
Int. Cl. A47j *27/08*
U.S. Cl. 126—389 **5 Claims**



A deep well grease pressure-frying appliance with an electrical circuit including a pressure-responsive switch and a

electromagnetic vent valve for intermittently venting the vessel into a bottom chamber so as to provide periodic pressure pulsations or surges in the grease, which provides quicker and deeper penetration of the grease into a food article contained in the vessel.

3,618,588

CARAMEL COLOR MANUFACTURE

Mohammad H. Anwar, Tappan, and Marvin Calderon, Hyde Park, both of N.Y., assignors to Pepsi Co., Inc., Long Island City, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,131
Int. Cl. A23g *3/32*
U.S. Cl. 127—34 **9 Claims**

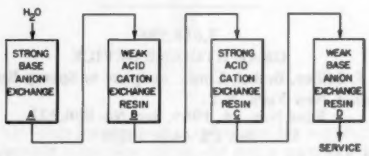
Caramel color is produced from fruit by heating the juice of the fruit in the presence of a caramelization catalyst and removing fruit flavor components during the process.

3,618,589

DESALINATION PROCESS BY ION EXCHANGE

Lorenzo Tavani, Milan, Italy, assignor to Sybron Corporation, Rochester, N.Y.

Filed Mar. 16, 1970, Ser. No. 20,143
Int. Cl. B01d *15/04*
U.S. Cl. 127—46 A **16 Claims**



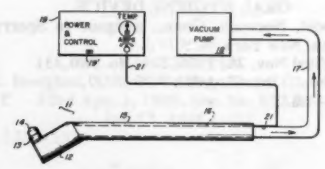
A method for demineralizing fluids comprising contacting the fluid to be treated with a first bed of strong base anion resin in the bicarbonate form, contacting said fluid with a weak acid and strong acid cation resin and finally contacting the fluid with a weak base anion resin. The anion resins are regenerated by passing aqueous bicarbonate solution through the strong base resin, the effluent therefrom is passed through the weak base resin. The cation resins are regenerated by passing a mineral acid solution through the strong acid resin and the effluent therefrom is passed through the weak acid resin.

3,618,590

THERMAL ELECTRIC DENTAL PULP TESTER

Ulrich Anton Frank, Yardley, and Jerome Julius Freundlich, Morrisville, both of Pa., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 27, 1969, Ser. No. 837,289
Int. Cl. A61b *10/00, 19/00*
U.S. Cl. 128—2 R **5 Claims**



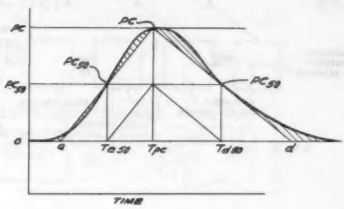
A thermoelectric probe for applying heat or cold to a localized area of a body for medical treatment comprising a thermoelectric module mounted in thermal conductive contact with a heat transfer unit including a honeycomblike assembly for maximizing conduction of heat from the module, and a heat exchange system including a pair of concentric tubular units connected to one side of the honeycomblike unit. One of the tubular units is coupled at its remaining end to an air suction pump for drawing ambient air through the honeycomblike unit.

3,618,591

CARDIAC OUTPUT DETERMINATION METHOD FOR USE WITH DYE DILUTION PROCEDURES

Edward C. Bradley, 1140 Linda Vista Ave., Pasadena, Calif., and John W. Barr, 653 E. Ada Ave., Glendora, Calif.

Filed Apr. 9, 1969, Ser. No. 814,551
Int. Cl. A61p *5/02*
U.S. Cl. 128—2.05 F **2 Claims**



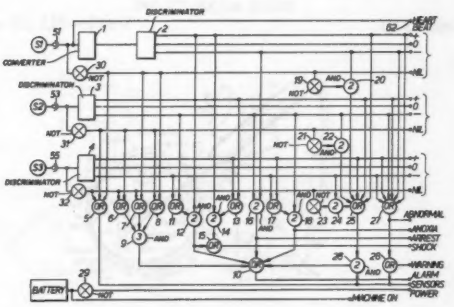
The disclosure concerns a method and apparatus for quickly determining the area under a dye dilution curve, based upon triangle congruency, for use in rapid determination of cardiac output.

3,618,592

DIAGNOSTIC PATIENT MONITOR

John Stewart Simpson Stewart, 50 The Common, Parbold, Wigan, Lancashire, England

Filed Aug. 11, 1969, Ser. No. 848,930
Claims priority, application Great Britain, Aug. 9, 1968, 38,245/68
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 R **9 Claims**



A diagnostic patient monitor is provided which monitors the condition of a patient by means of a sensor system to provide output signals, not less than six in number, indicative of normal, above normal or below normal sensed conditions from at least two sensors. The signals are used to directly indicate each condition and are combined so that specific combinations of abnormal signals provide an indication of the condition of the patient resulting in the abnormal signals. Two abnormal signals occurring simultaneously result in the activation of an alarm.

3,618,593

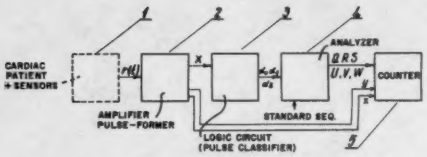
METHOD OF AND A SYSTEM FOR THE AUTOMATIC ANALYSIS OF HEART DISTURBANCES

Choudomir Kirilov Nachev; Garo Bohos Astardjian; Hristo Radey Hristov, and Kiril Kirilov Boev, all of Sofia, Bulgaria, assignors to Institut Po Technitcheska Kibernetika Pri Ban, Sofia, Bulgaria

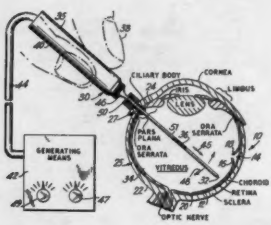
Filed Nov. 21, 1968, Ser. No. 777,575
Claims priority, application Bulgaria, Sept. 2, 1968, 10595
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **4 Claims**

A device or system for automatically analyzing disturbances of heart rhythm and a method of such analysis

wherein a sequence of cardiac waves, e.g. as generated by a transducer attached to the body of a patient is converted into normal pulses occurring within predetermined time intervals following a preceding pulse. The disturbance is characterized by delayed pulses occurring at a greater time interval for accelerated pulses with a shorter interval. Information is stored in a memory in the form of sequences of such pulses representing various cardiac conditions and and a contemporary condition is compared with the stored information to produce output signals indicating the condition.



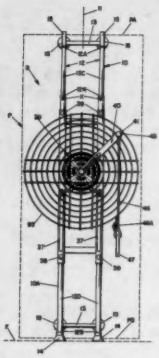
3,618,594
ULTRASONIC APPARATUS FOR RETINAL REATTACHMENT
Anton Banko, Brooklyn, N.Y., assignor to Surgical Design Corporation, Queens, N.Y.
Division of Ser. No. 760,003, Sept. 16, 1968, Pat. No. 3,528,410. Filed Apr. 6, 1970, Ser. No. 25,991
Int. Cl. A61h *1/00*; **A61f** *9/00*
U.S. Cl. 128—24 A **11 Claims**



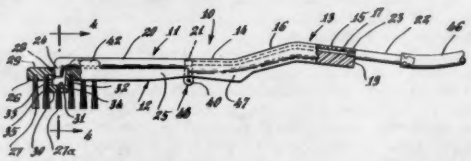
The method and apparatus relate to performing surgical operations on the eye in vivo, including retina reattachment by the insertion of an ultrasonic probe within the eye.

3,618,595
PHYSICAL THERAPY DEVICE WITH VERSATILE ADJUSTING AND MOUNTING MEANS
Bernhardt Stahmer, 1509 Chicago St., Omaha, Nebr., and Joseph F. Opocensky, Rte. #1 Box 80, Valley, Nebr.
Filed June 15, 1970, Ser. No. 46,089
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 **20 Claims**

A physical therapy device for imparting rotary and reciprocating exercising motions to arms and legs of languid patients. There is a plurality of novel structural features rendering the physical therapy device versatile in providing valuable exercise for variously endowed patients and at various levels of muscular development, and for patients of various degrees of vigor including even for those that can receive treatment from sitting or supine positions only. The physical device has further versatility in that it can be stably mounted for use in all sorts of encountered environments, including within the normal dwelling home, in hospital rooms, and elsewhere.

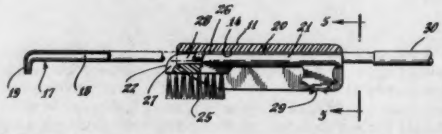


3,618,596
ORAL HYGIENE DEVICE
Lester F. Miller, Bethel, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 26, 1969, Ser. No. 880,323
Int. Cl. A61h *13/00*
U.S. Cl. 128—66 **11 Claims**



An oral hygiene device for cleaning the teeth and massaging the gums including a brush member and a fluid discharge member having a nozzle wherein both members can be used separately or in combination. The brush member is pivotally connected to a handle for movement between a first position adjacent the nozzle and a second position wherein the brush is disposed adjacent the handle.

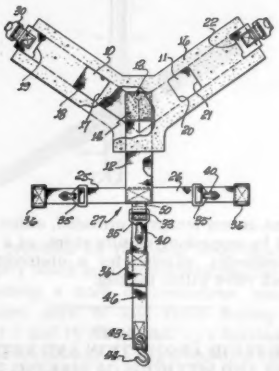
3,618,597
ORAL HYGIENE DEVICE
Siegfried Godel, Norwalk, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 26, 1969, Ser. No. 880,331
Int. Cl. A61h *9/00, 7/00*
U.S. Cl. 128—66 **7 Claims**



An oral hygiene device for cleaning the teeth and massaging the gums including a brush member and a fluid discharge

member having a nozzle, wherein both members can be used separately or in combination. The brush member is adapted to be displaced along the fluid discharge member to a position adjacent the nozzle or to a storage position within a handle member.

3,618,598
LEG TRACTION ANKLE STRAP
Ronald H. Davis, 1922 Somerset, Cardiff-by-the-Sea, Calif.
Filed Dec. 8, 1969, Ser. No. 883,124
Int. Cl. A61f *5/04*
U.S. Cl. 128—85 **5 Claims**

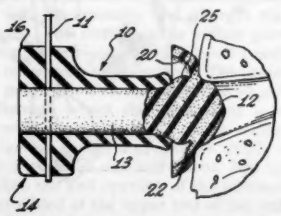


An ankle wrap for use with a splint and leg support members to provide a traction splint. An ankle wrap having five strap elements joined together, with first and second straps for wrapping a foot in overlapping relation, and fourth and fifth straps carried on a third strap for connection to the first and second straps to pull the first and second straps tight on the foot, and means for connecting the third strap to the splint and shortening the third strap to apply tension to the foot, while maintaining the foot in position 90° to the leg.

3,618,599
ORTHOPEDIC DEVICE HAVING A RESIN CURABLE BY ULTRASONIC ENERGY
Leroy E. Beightol, Los Angeles, Calif., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Aug. 4, 1969, Ser. No. 847,433
Int. Cl. A61f *5/04*
U.S. Cl. 128—90 **9 Claims**

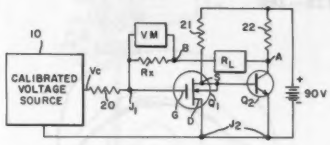
The present invention provides a novel method for the application of an orthopedic cast to a body member which comprises enclosing said member in an ultrasonic energy curable polymer impregnated, woven or nonwoven fabric, and curing said resin by exposure to ultrasonic energy to form a hard, lightweight, physiologically inert integral porous cast.

3,618,600
EAR STOPPLE
Harry E. Douglass, 3146 N. Verdugo Road, Glendale, Calif.
Filed Apr. 1, 1969, Ser. No. 812,047
Int. Cl. A61f *11/02*
U.S. Cl. 128—152 **7 Claims**



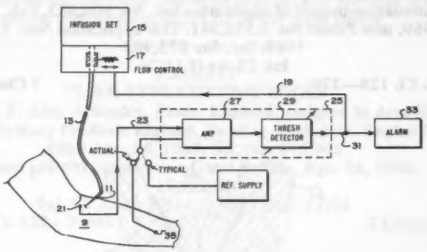
An ear protector comprising a generally mushroom-shaped soft rubber head and stem, with a harder soft rubber retainer sleeve therearound, and a frustoconical section on the stem between the end portion of the retainer sleeve and the head.

3,618,601
IONTOPHORESIS UNIT
Thatcher W. Richardson, 5345 Bevedere, Indianapolis, Ind.
Filed Oct. 16, 1969, Ser. No. 867,003
Int. Cl. A61n *1/30*
U.S. Cl. 128—172.1 **6 Claims**



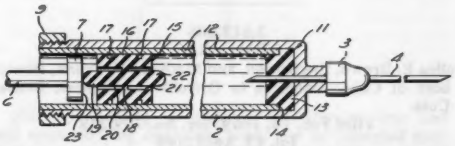
An iontophoresis unit comprising means for probing into a biological medium, the probing means providing a resistance load, a high-voltage source, a low-voltage, calibrated current source, and an amplifier. The amplifier includes an output junction and a summing junction between which the probe means is connected, first circuit means for connecting the summing junction to one side of the low-voltage source and second circuit means for connecting the output junction to one side of the high-voltage source.

3,618,602
LIQUID INFUSION INFILTRATION DETECTION APPARATUS AND METHOD
Robert F. Shaw, 350 Parnassus Heights, San Francisco, Calif.
Filed Aug. 28, 1969, Ser. No. 853,829
Int. Cl. A61m *05/00*
U.S. Cl. 128—214 E **12 Claims**



Improved method and means is provided for detecting undesirable infiltration into the perivascular tissue of liquid which is normally administered intravenously or intraarterially.

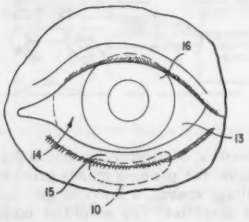
3,618,603
SYRINGE
Myron F. Levenson, 2974 Montgomery Road, Shaker Heights, Ohio
Filed Jan. 29, 1969, Ser. No. 794,867
Int. Cl. A61m *05/22*
U.S. Cl. 128—218 P **3 Claims**



A cartridge for use in a hypodermic syringe characterized by an aspirating piston comprising a resilient body portion

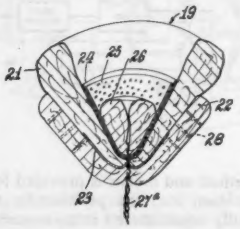
taking the general form of a cylinder; two voids extending in opposite directions within such body portion; and, separating the two voids from each other, a transverse web provided with oppositely directed protuberances.

3,618,604
OCULAR INSERT
Richard A. Ness, Fergus Falls, Minn., assignor to Alza Corporation
Filed June 9, 1969, Ser. No. 831,761
Int. Cl. A61m *31/00*
U.S. Cl. 128—260 **21 Claims**



Drug-dispensing ocular insert is comprised of a flexible body of polymeric material that is insoluble in tear liquid and has an imperforate surface. The polymeric material contains a drug which is dispensed to the eye in a therapeutically effective amount by diffusion through the polymeric material. The ocular insert is adapted for insertion in the cul-de-sac of the conjunctiva between the sclera of the eyeball and the lower lid, to be held in place against the eyeball by the pressure of the lid.

3,618,605
CATAMENIAL TAMPON
Jacob A. Glassman, 1680 Meridian Ave., Miami Beach, Fla.
Continuation-in-part of application Ser. No. 800,983, Feb. 20, 1969, now Patent No. 3,572,341. This application Nov. 12, 1969, Ser. No. 875,903
Int. Cl. A61f *13/20*
U.S. Cl. 128—270 **7 Claims**



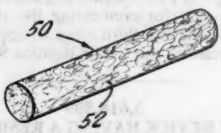
A normally compacted tampon comprised of a laminated structure which embodies the arrangement of highly fluid absorbent layers that allow the menstrual wastes to be initially directed into a central absorbent core to thereby cause the core to expand and insure maximum expansion of the tampon as a whole so as to insure maximum absorption of the menstrual waste without overflow or strike-through, thus maintaining a blood-dry tampon exterior to the very end of its useful life.

3,618,606
STOMA BAG
Rollen E. Brown, Englewood, and Mathilda C. Frank, Denver, both of Colo., assignors to Osteolite Appliances, Denver, Colo.
Filed Feb. 14, 1969, Ser. No. 799,248
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **6 Claims**

A stoma bag formed of flat sheets of polyethylene or like material, characterized by a mounting pad at the intake thereof which is adapted to be cemented to the body of a patient. The mounting pad is affixed to the bag at a connecting face about the stoma orifice and this pad includes a peripheral flap about the connecting face. At the outer side

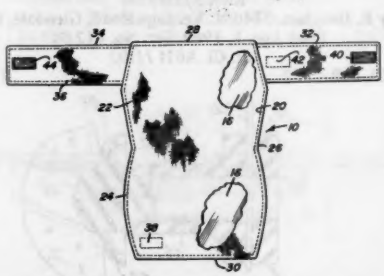
of the bag, an access means is provided, either as a slit normally closed by enmeshing closure strips, or a flap valve. A further embodiment, adapted for a ureterostomy bag includes a check valve within the bag.

3,618,607
SALINE FLUID ABSORPTION AND RETENTION TAMPONS AND METHODS OF MAKING THE SAME
Myron B. Ells, Somerville, and Fred H. Steiger, East Brunswick, both of N.J., assignors to Johnson & Johnson
Filed Feb. 17, 1970, Ser. No. 12,002
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **7 Claims**



An improved saline fluid absorption and retention tampon having a density of from about 0.4 gram per cubic centimeter to about 0.8 gram per cubic centimeter and comprising water-insoluble, wet cross-linked carboxyalkyl cellulose having average degrees of substitution of from about 0.4 to about 1.3, and methods of making the same.

3,618,608
DIAPER WITH FASTENER
Mary E. Brink, 4607 W. Marten Ave., Glendale, Ariz.
Filed Feb. 16, 1970, Ser. No. 11,415
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **4 Claims**



A multilayer diaper having a belt connected thereto which secures the main section of the diaper around an infant's bot-

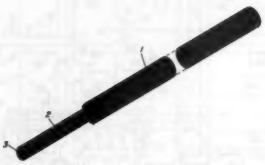
tom by means of mating "Velcro" plush pile fasteners that are sewn to the belt and main section of the diaper.

3,618,609

BRAIDED ABSORBENT MATERIAL

Arthur Glick, Danbury, and Sol Singerman, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1969, Ser. No. 887,523
Int. Cl. A61f *13/00*
U.S. Cl. 128—296 3 Claims



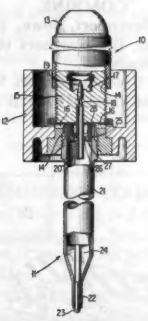
A process is provided for removing body fluids from an area under surgery which comprises contacting the fluid with a brush comprising a core of continuous monofilament hydrophilic fibers, each of said fibers having a denier between about 1.5 and 10 surrounded by a braided sheath of multifilament yarn, said yarn having a denier in the range of about 100 to about 2,400.

3,618,610

CRYOGENIC SURGICAL APPARATUS

Theodore N. Hannant, Cedar Grove, N.J., assignor to Walter Kidde & Company Inc., Belleville, N.J.

Continuation-in-part of application Ser. No. 728,448, May 13, 1968, now abandoned. This application Apr. 22, 1970, Ser. No. 30,910
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.1 6 Claims



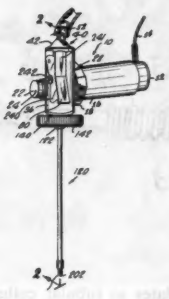
Cryogenic Surgical Apparatus in which a surgical instrument is threaded into an assembly that charges the instrument with refrigerant. The instrument is hollow providing a chamber for holding the refrigerant which cools a metallic tip on the instrument to subzero temperatures. The upper end of the instrument is provided with an annular wall defining a central opening through which the instrument is charged. The charging assembly is provided with a tube which is connected to the refrigerant supply and extends axially into the threaded bore which receives the instrument. The tube is of smaller diameter than the end opening of the instrument and venting ports are provided at the upper end of the instrument receiving bore to allow gases to escape during the charging of the instrument.

3,618,611

VACUUM ROTARY DISSECTOR

Julius C. Urban, 10533 Sarah St., North Hollywood, Calif.

Filed Mar. 5, 1969, Ser. No. 804,598
Int. Cl. A61b *17/32*
U.S. Cl. 128—305 7 Claims



The device is a surgical instrument appropriately termed a vacuum rotary dissector, for purposes of performing delicate surgical operations such as brain operations for removing undesired tissue, etc. A thin elongated tubular member or sleeve which is motor driven, rotates within another elongated sleeve having a bullet-shaped end with a side opening in it. At the end of the inner sleeve, there is a cutout providing side edges which are cutting edges that rotate adjacent to the side opening in the outer sleeve, the tip end of the inner sleeve also being bullet shaped to conform to the interior contour of the tip and of the outer sleeve.

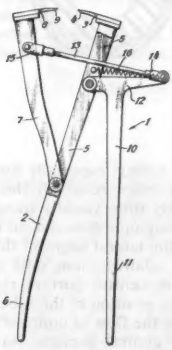
The improvements reside in the contours of the tip ends of the sleeves, the particular shape of the side opening in the outer sleeve, and the particular configuration of the cutting edges or surfaces on the inner sleeve. Also, axial pressure is maintained on the outer sleeve to urge its end surfaces into engagement with surfaces of the tip of the inner sleeve.

3,618,612

PLIER-TYPE CUTTING TOOLS

David F. Ahn, Arkesden, Essex, England, assignor to Arnolds Veterinary Products Limited, Reading, Berkshire, England

Filed Apr. 14, 1969, Ser. No. 815,965
Claims priority, application Great Britain, Apr. 16, 1968, 17,962/68
Int. Cl. A61b *17/32*; B26b *17/02*, *17/04*
U.S. Cl. 128—318 2 Claims

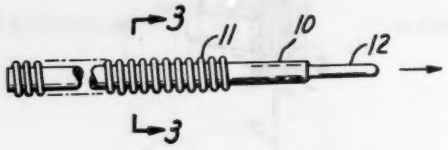


A plier-type cutting or gripping tool having first and second arms-carrying operating heads can be operated one-handed by gripping an operating arm and the first arm and pressing the same together; the mechanical advantage of the tool increasing as the operating heads approach one another.

3,618,613
ANTITHROMBOTIC INTRAVASCULAR CATHETER REINFORCED WITH NONKINKING MEANS

Rudolf R. Schulte, Santa Barbara, Calif., assignor to Heyer-Schulte Corporation, Santa Barbara, Calif.

Filed May 19, 1969, Ser. No. 825,656
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 1 Claim



This invention relates to tubular catheters which are inserted through veins to enter the peritoneal cavity for medical purposes. Such tubing catheters have other medical applications such as for drainage or for introduction of medical materials, but since the tubing is of such a small diameter, it has been subject to difficulties in handling. The current invention circumvents problems caused by kinking during use by the application of a wire spring coiled around the tubing in interference fit and then coated with a silicone material to provide the surface finish required for insertion. The distal end of the catheter may be coated with an antithrombotic coating.

3,618,614
NONTOXIC RADIOPAQUE MULTIWALL MEDICAL-SURGICAL TUBINGS

Vincent J. Flynn, Englewood, N.J., assignor to Scientific Tube Products, Inc., Englewood, N.J.

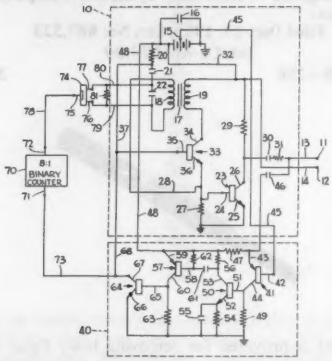
Continuation-in-part of application Ser. No. 518,186, Jan. 3, 1966, now abandoned, Continuation-in-part of application Ser. No. 571,592, Aug. 10, 1966, now abandoned. This application May 6, 1969, Ser. No. 826,778
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 10 Claims

Multiwall surgical tubing, especially for stomach, thoracic or rectal use, has an inner, relatively thick transparent tube encased in a relatively thin, visually transparent, outer shell which contains a radiopaque material, so that as the X-radiation passes through the lateral edges of the composite tube it must pass through a relatively long path at the side edges of the tubing, while the central portion remains substantially transparent. Thus, the position of the tube is readily observed by fluoroscopy, while the flow of contrast media or clots may be observed in the central portion. As used for a heart, ureteral or vein intubation catheter, the multiwall tubing is formed of extruded polyethylene containing a nontoxic, radiopaque-plasticizing compound such as bismuth, oxychloride, which is encased in an extruded outer shell of transparent polyethylene having a hardness and exterior smoothness superior to that of the inner tubing, which outer shell also increases the angular resistance to twisting in use.

3,618,615
SELF CHECKING CARDIAC PACEMAKER

Wilson Greatbatch, Clarence, N.Y., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sept. 2, 1969, Ser. No. 854,583
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P 15 Claims

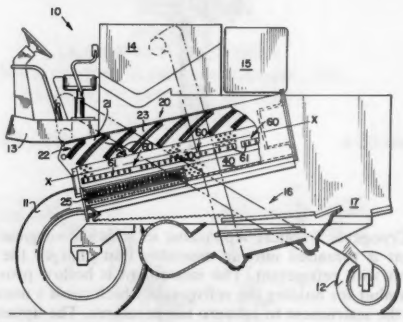


A cardiac pacer including a pair of output terminals, at least one of which is adapted to be placed in operative contact with a patient's heart, coupled to a pulse generator which includes an RC timing circuit connected to a power supply. A signal responsive circuit coupled to one of the output terminals provides a signal in response to each ventricular beat of the patient's heart. The capacitance of the timing circuit is periodically reduced by a capacitor connected in series with the timing circuit and in parallel with a field effect transistor controlled by a binary counter connected to the pacer signal responsive circuit. The resulting periodic test pulse of reduced width is utilized to indicate marginal pacer operation and possible impending failure if the patient's heart fails to respond to the test pulse.

3,618,616
UNIVERSAL ROTOR AND CONCAVE FOR AXIAL FLOW COMBINE

William H. Knapp, Davenport, Iowa, and Ernest M. Van Buskirk, East Moline, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 6, 1970, Ser. No. 996
Int. Cl. A01f *12/26*
U.S. Cl. 130—27 T 8 Claims



An axial flow combine equipped to operate in various crops and crop conditions without replacing the basic components. Spike-tooth elements are detachably mounted on the threshing cylinder concave and side grates. The rotor has spike teeth along its outer periphery that intermesh with those on the threshing cylinder. When operating in condi-

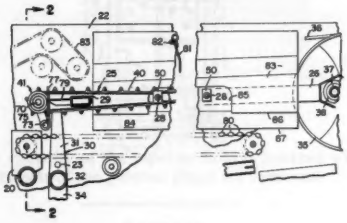
tions not requiring spike teeth, the detachably mounted spike-tooth elements are removed from the threshing cylinder.

3,618,617

SEPARATOR FOR TOMATO HARVESTER AND THE LIKE

Lauren W. Gates, Rio Vista, and Michael J. Hartwig, Walnut Creek, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed May 1, 1968, Ser. No. 725,874
Int. Cl. A01d
U.S. Cl. 130—30 **26 Claims**



A separator for mechanical harvesters of the type where the fruit or other heavy part of the crop is separated from the remainder of the plant by a shaking action. A generally rectangular frame has a front end where harvested plants are introduced and a rear end where they leave. A rockshaft supports the front end of the frame for substantially pure fore-and-aft movement, while crank means support the rear end of the frame and drive it as a unit in a generally circular motion involving both vertical and fore-and-aft components. There is a plurality of pulleys at each end of the frame, those on the rear end being mounted on the crank pin and driven by the crank means, those on the front end being idlers individually spring mounted. The pulleys carry a plurality of closed-loop belts with upwardly extending projections for engaging harvesting plants and moving them from the front to the rear of the frame. A collecting conveyor beneath the frame catches the fruit shaken from said plant and conveys it elsewhere. Thus, the more easily loosened fruit is shaken off by fore-and-aft shaking while the fruit more difficult to loosen is shaken off by the gradual introduction of vertical movement as the crop moves rearwardly. The belt, pulleys, and belt guides are also novel in structure.

3,618,618

TOBACCO SMOKE FILTERING MATERIAL

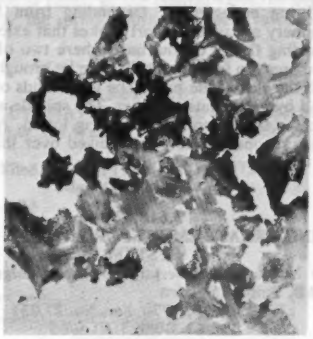
Robert L. Strickman, River Vale, N.J., assignor to The Robert L. Strickman Foundation, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 599,495, Dec. 6, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 424,626, Jan. 11, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 59,035, Sept. 28, 1960, now abandoned. This application Apr. 11, 1968, Ser. No. 721,563
Int. Cl. A24d *01/06*; A24f *25/00*
U.S. Cl. 131—10.7 **18 Claims**

Filter materials for filtering aerosols, such as cigarette filters for filtering tobacco smoke, are provided comprising rigid polyurethane particles devoid of any cellular structure. Preferably the particles are granular and of jagged, spiny, cragged nature. The rigid polyurethane is produced from a polyol and a polyisocyanate.

The particles are produced by first preparing a rigid polyurethane foam, preferably with the aid of a blowing agent, granulating the foam, treating the granules with hot water or steam to hydrolyze unreacted isocyanate and other free materials to render them inert, and then dried.

Preferably, inorganic additives may be present during the preparation of the rigid polyurethane foam, such as the lower alkyl silicates, e.g., ethyl silicate, and water soluble salts of



the acids of metals of groups VA and VIA of the Periodic Table, e.g., sodium tungstate.

Inorganic additives may be added to the filter particles, such as an alkaline earth metal carbonate, silicate or hydroxide.

3,618,619

TOBACCO SMOKE FILTERS

John E. Kiefer, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1970, Ser. No. 16,209
Int. Cl. A24f *13/06*
U.S. Cl. 131—266 **3 Claims**

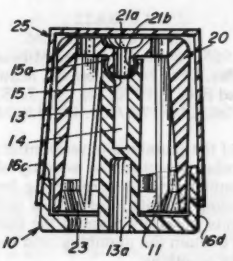
Crimped celluclose acetate filter tow having dispersed therein at least one metal oxide selected from zinc oxide, ferric oxide and cuprous oxide, the tow being adapted to be activated by the application thereto of an organic activating agent to alter the characteristics of the individual filaments of the tow to make accessible the oxide dispersed in the two to hydrogen cyanide for removal thereof from the vapor phase of tobacco smoke. Representative of the organic activating agents are triethylene glycol, triacetin, polyethylene glycol, triethylene glycol diacetate, triethyl citrate, propylene glycol, and dimethoxyethyl phthalate. Also disclosed are tobacco smoke filters made from the tow.

3,618,620

HAIR CURLER AND FROSTING TOOL

James P. Williams, Lubbock, Tex., assignor to Darling Curler, Incorporated, Lubbock, Tex.

Continuation-in-part of application Ser. No. 666,320, Sept. 8, 1967, now abandoned. This application Sept. 23, 1970, Ser. No. 74,583
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **6 Claims**



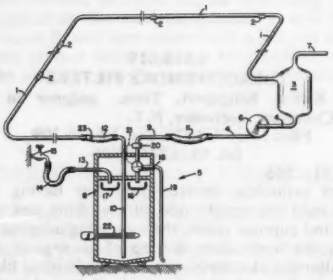
There is a circular base member having a centrally positioned upstanding spindle at its center, a slot extending in

from the edge and to one side of the spindle and an upstanding flange at the periphery increasing in height from adjacent one side of the slot in the base to the other side of the slot thereby forming an inclined ramp on the top of the flange. Received on the spindle is a cage having a circular top with a central aperture received by the top end of the spindle in a formed fitting engagement. Depending from the circular top's periphery are spaced apart spokes that extend inside of the upstanding flange on the base where two of the spokes are spaced apart to form a slot that can be brought into alignment with the slot in the base. The lower ends of the spokes are jointed by an arcuate member. The spindle and top have a passage for the reception of curling lotion. An enclosing cap having an open bottom is received over the assembled cage and base.

3,618,621
WASHING ARRANGEMENT FOR PIPELINE MILKING SYSTEM

Sven-Ake Nordegren, Sodertalje, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 9, 1970, Ser. No. 27,031
Int. Cl. B08b *3/10, 9/06*
U.S. Cl. 134—57 R **7 Claims**



Means are provided for inducing flow of water from a hot water source through a pipeline milking system; and a reversing valve has a first position wherein water which has passed through the system is discharged therefrom, the valve having a second position wherein water which has passed through the system is returned thereto for repeated flow through the system. By temperature-sensing means operatively connected to this valve, it is actuated from said first to said second position in response to heating of the system to a predetermined temperature by hot water flowing through it; and means responsive to this actuation of the valve are provided for adding detergent to the water flowing through the system.

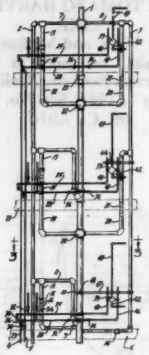
3,618,622
PLUMBING SYSTEM

Allen S. Zien, 9551 N. Lake Drive, Milwaukee, Wis., and Gary R. Mueller, 2842 N. Lefelier St., Milwaukee, Wis.

Filed Feb. 2, 1970, Ser. No. 7,753
Int. Cl. F17d *1/08;* **E03d** *9/04*
U.S. Cl. 137—1 **10 Claims**

Roughing in of the plumbing in residential and commercial buildings and other structures is accomplished by utilizing factory preassembled units incorporating both water supply and drainage piping complete for one or multiple floors and installing the units generally prior to the construction of the wall which is to contain the plumbing, and thereafter erecting the wall to fit the plumbing.

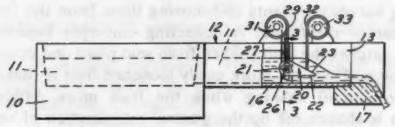
The units are assembled from pipe sections rigidly joined together and with the supply pipes tied or banded to the drain pipes at prearranged crossings to provide the plumbing for a plurality of service rooms disposed adjacent to one another or one above another as may be desired, and to provide a generally rigid portable unit suitable for transfer from the factory to the construction site.



3,618,623
METHOD FOR CONTROLLING THE RATE OF FLOW OF MOLTEN GLASS FROM A CHANNEL

Premakaran Boaz, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 17, 1969, Ser. No. 817,134
Int. Cl. C03b *5/26*
U.S. Cl. 137—1 **1 Claim**



A liquid is delivered to a channel. The channel contains a baffle extending thereacross at a position below the top surface of the liquid but spaced from the bottom of the channel. By varying the submerged position of the baffle in the liquid with respect to the bottom of the channel, the rate of flow of the liquid through the channel is controlled. A prescribed quantity of liquid may be delivered from the channel by positioning the baffle at a prescribed, submerged position within the liquid flowing through the channel.

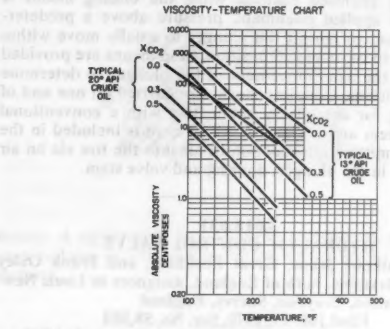
3,618,624
FLUID PIPELINING

Juris Vairogs, Tulsa, Okla., assignor to Cities Service Oil Company

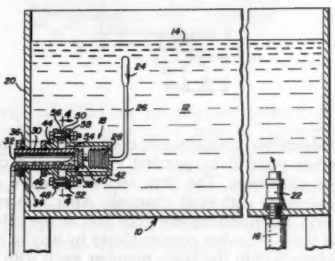
Filed Feb. 26, 1970, Ser. No. 14,554
Int. Cl. F17d *1/16*
U.S. Cl. 137—13 **10 Claims**

The present invention is a method for lowering the viscosity of a fluid being transferred in a pipeline by the introduction of a miscible gas, for example carbon dioxide, into the fluid that is being transported. The miscible gas-fluid mixture is then pumped at such conditions of temperature and pressure so as to prevent the formation of a gaseous phase by

utilizing the unique two-phase liquid equilibrium characteristic of certain miscible gases in solution with hydrocarbons. The viscosity of the pipeline fluid is lowered while the deterrent effects of the gaseous phase are removed.

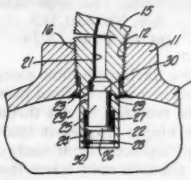


3,618,625
ICE AXE VALVE
William R. Walters, 1300 Sunset, Pawhuska, Okla.
Filed Oct. 29, 1969, Ser. No. 872,109
Int. Cl. A01k *7/02*
U.S. Cl. 137—62 **10 Claims**



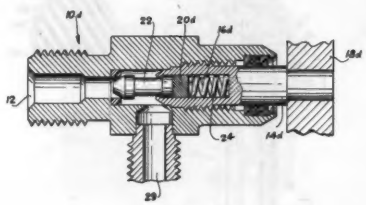
Water stored in a tank is prevented from freezing by opening of a valve device conducting a restricted outflow of water under control of a temperature-sensing element located adjacent the surface of the water where freezing begins. The outflow of water induces inflow of water at a higher temperature from a remote source to maintain the temperature level of the water within the tank above an adjusted value.

3,618,626
SAFETY VALVE FOR COMPRESSED GAS CYLINDER
Anthony Russo, Hacienda Heights, Calif., assignor to Ventro Machine Products, Inc., Buena Park, Calif.
Filed Feb. 2, 1970, Ser. No. 7,801
Int. Cl. F16k *13/04*
U.S. Cl. 137—68 **1 Claim**



The body of a conventional valve assembly for controlling flow from a compressed gas cylinder is extended within the cylinder to receive a safety valve. Should the exposed control valve be damaged, escape of gas at abnormally high-flow rates is prevented by the safety valve, the latter moving by venturi effect against the action of a spring to restrict the rate of escaping gas to a safe value. When gas ceases to escape either because of repair of the control valve, or depletion of the gas supply, the spring returns the safety valve to its initial position.

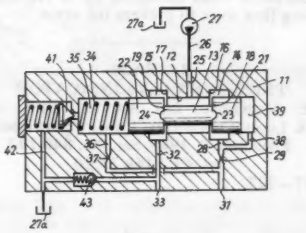
3,618,627
VALVE AUTOMATIC PRESSURE RELEASE MEANS
William Wagner, c/o Watsco, Inc., 1800 W. 4th Ave, Hialeah, Fla.
Filed Oct. 29, 1969, Ser. No. 872,074
Int. Cl. F16k *17/38*
U.S. Cl. 137—73 **1 Claim**



An automatic means incorporated into the structure of a system valve for releasing system pressure, the means comprising a fusible element located in the valve between the internal (high) pressure of the system and a low-pressure field such that elimination of the plug releases the system high pressure to the field low pressure. The means may additionally provide for an automatically reclosing pressure relief element such as a spring.

In primary embodiments the automatic pressure release means comprises a fusible plug located in the valve stem. Pressure release is accomplished by elimination of the plug by either thermal or mechanical means, or a combination. In secondary embodiments the plug is angularly located in the valve housing.

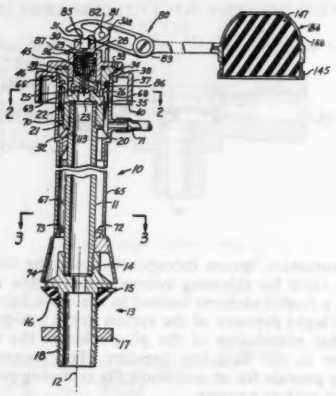
3,618,628
THROTTLING ARRANGEMENT FOR CONTROLLING THE FLOW FROM TWO OUTLETS
Manfred Kramer, Fellbach-Lindle, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed May 28, 1970, Ser. No. 41,397
Claims priority, application Germany, June 28, 1970, P 19 32 996.5
Int. Cl. G05d *11/03*
U.S. Cl. 137—101 **10 Claims**



A spring-biased regulating valve has a first regulating position directing fluid from a pump at a constant pressure to a first outlet, and directing excess fluid to a second outlet. The regulating valve is held in the first regulating position by fluid pressure in a regulating chamber to which fluid is supplied through a throttle from the first outlet. When the pressure in the first outlet rises above a desired constant value, a biased control valve responds to the pressure increase and relieves the pressure in the regulating chamber so that the regulating

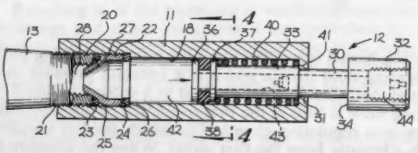
valve moves to a second regulating position in which all the fluid from the pump is supplied to the second outlet until the pressure in the first outlet has again its desired constant value. The consumer connected to the second outlet is not disturbed by interruption of the load on the first outlet, and different pressures are possible for the first and second outlets.

3,618,629
BALLCOCK VALVE
William T. Heyer, 225 Mohawk Road, and Dale F. Soukup, 318 Mohawk Road, both of Santa Barbara, Calif.
Filed Nov. 26, 1969, Ser. No. 880,199
Int. Cl. F16k *21/18*
U.S. Cl. 137—218 **20 Claims**



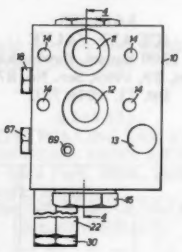
A ballcock valve for controlling the flow of water from an inlet pipe to a tank, which valve includes an inlet seat at which the flow of water is controlled. A body attached to the inlet pipe bounds an internal cavity which is divided by a piston assembly into a bias chamber and a flow chamber. A seal is carried by the piston to engage the inlet seat, and is moved toward and away from the seat to close and to open the inlet port. A bias port bypasses or extends from end-to-end of the piston element so as to conduct inlet pressure to the bias chamber. A vent port which can be opened and closed by mechanism associated with the level of the water of the tank controls the pressure within the bias chamber. The piston assembly is a unitary conveniently removable and replaceable element with a cup-shaped member restrained laterally at its base by a rim. An outlet port extends through the wall of the body to provide for flow of water from the flow chamber to the tank. In one embodiment of the invention an antisiphon skirt surrounds the body so as to block siphoning backflow while admitting air to regions subject to said siphoning flow so as to prevent the same.

3,618,630
PRESSURE VALVE INDICATOR
Anthony E. Marcaccio, Los Angeles, Calif., assignor to Michael S. Louis, Studio City, Calif., a part interest
Filed July 9, 1969, Ser. No. 840,192
Int. Cl. F16k *15/20*
U.S. Cl. 137—227 **2 Claims**



The pressure valve indicator disclosed herein includes a hollow housing for slidably mounting a plunger having two positions, one position being substantially within the housing and the other position being substantially extended out of a selected end of the housing. Resilient biasing means within the housing normally urge the plunger into the housing to its substantially enclosed position while the biasing means is yieldable to applied pneumatic pressure above a predetermined amount to permit the plunger to axially move within the housing to its extended position. Stop means are provided for limiting the axial movement of the plunger to determine the two positions. Coupling means are carried on one end of the housing for detachably connecting with a conventional tire valve stem and a check valve or core is included in the plunger permitting introduction of air into the tire via an air passageway in the plunger, housing and valve stem.

3,618,631
HYDRAULIC CONTROL VALVE
Michael Anthony Jeans, Great Bookham, and Frank Oxley Baines, Hextable, both of England, assignors to Louis Newmark Limited, Croydon, Surrey, England
Filed July 27, 1970, Ser. No. 58,584
Claims priority, application Great Britain, Aug. 5, 1969, 39089/69
Int. Cl. F16k *51/00*
U.S. Cl. 137—269 **10 Claims**



There is described an hydraulic control valve comprising a body member pierced by parallel channels and containing three valve chambers. The first and third valve chambers each communicate with both channels. Apertures respectively at one end, intermediate the ends and at the other end of the second valve chamber communicate by way of respective conduit means within the body member each with a respective port in a surface of the body member and respectively with the first and second channels and the first valve chamber. Reversible stop means in the conduit means permit different valve functions to be performed by valve means contained in a plurality of the valve chambers.

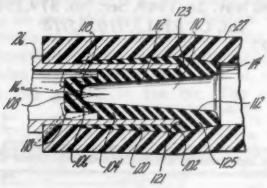
ERRATA

For Classes 137—377 and 137—514.7 see:
Patent Nos. 3,618,688 thru 3,618,690

3,618,632
CHECK VALVE
Frederick F. Stevens, Sandy Hook, Conn., assignor to Hoff-Stevens, Inc., Ansonia, Conn.
Continuation-in-part of application Ser. No. 661,079, Aug. 16, 1967, now abandoned. This application July 31, 1969, Ser. No. 850,313
Int. Cl. F16k *15/14*
U.S. Cl. 137—515.7 **8 Claims**

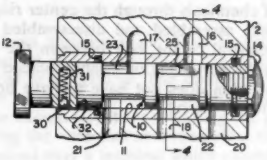
A fluid check valve having a hollow elongated self-supporting nipple supported in a path of fluid flow and made from a resilient deformable material. A slit through the closed upstream end of the nipple divides it into adjacent sections which are laterally displaced from each other to provide a path of fluid flow therebetween when the fluid pressure on the downstream side of the nipple exceeds the fluid pressure on the upstream side thereof. Under the influence of back pressure the sections resiliently press against each other to prevent reverse fluid flow therebetween. The nipple has an

integral part which supports it in a fixed position in an associated conduit member and also forms a seal between the latter member and another conduit member connected



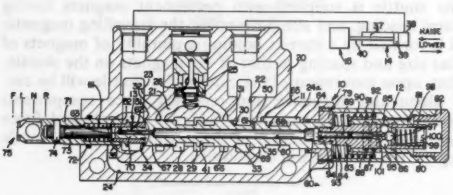
thereto. A rigid nipple insert may be provided to prevent inward collapse or deformation of the nipple due to fluid back pressure.

3,618,633
REVERSE VALVE FOR PNEUMATIC TOOL
Paul K. Bizilia, and Albert G. Wordsworth, both of Sayre, Pa., assignors to Ingersoll-RAnd Company, New York, N.Y.
Filed Jan. 12, 1970, Ser. No. 2,098
Int. Cl. F16k *11/00*
U.S. Cl. 137—560 **4 Claims**



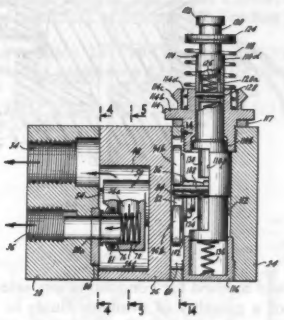
A reverse valve for an air-powered wrench including a spool valve mounted in a valve bore to reciprocate axially between alternate positions controlling the rotary direction of the wrench. The valve also rotates to progressively control the flow of fluid through the valve while providing an unrestricted flow of fluid through the valve when seifted from one axial position, wherein the flow is restricted, to the alternate axial position without changing its rotary position in the bore.

3,618,634
HYDRAULIC CONTROL VALVE WITH FLOW-SENSITIVE UNLATCHING MECHANISM
Vaughn A. Nelson, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Jan. 5, 1970, Ser. No. 756
Int. Cl. F15b *13/01*
U.S. Cl. 137—624.27 **13 Claims**



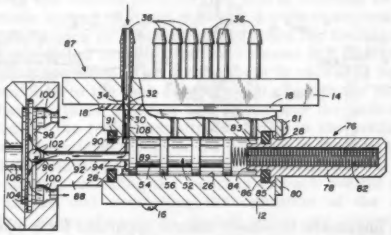
A hydraulic control valve for use in a fluid pressure system that operates a pressure-actuated cylinder, the valve including a detent latching mechanism for holding the control valve in position during a power stroke of the cylinder, and a flow-sensitive valve mechanism effective to prevent the operation of the latching mechanism until the cylinder has completed its stroke. The detent mechanism is unlatched by a fluid-pressure-responsive piston and the flow-sensitive valve mechanism limits the application of pressure to this piston until the flow of working fluid has ceased.

3,618,635
VALVE AND CONTROL
Alton K. Allen, 11 Flower Lane, Kings Point, N.Y.
Filed June 1, 1970, Ser. No. 42,241
Int. Cl. F16k *11/02, 39/04*
U.S. Cl. 137—625.2 **23 Claims**



A mechanically operated snap-action valve which is capable of functionally replacing a solenoid-controlled valve and of rapidly and precisely applying a source of air under pressure to a wide variety of pneumatic devices. The valve includes improved internal sealing arrangements and snap-action actuating mechanism responsive to actuating forces applied either manually or mechanically which actuating forces are of a relatively low order yet are capable of transferring a wide range of systems pressures with a high order of reliability and repeatability.

3,618,636
PNEUMATIC LOGIC VALVE
Charles J. Grimland, Garland, and Peter C. Huff, Dallas, both of Tex., assignors to Dynamco Inc., Dallas, Tex.
Filed Mar. 26, 1969, Ser. No. 810,746
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.6 **8 Claims**



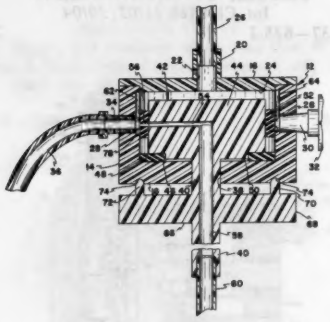
A pneumatic logic valve including a cylinder that is closed by end caps and a valve spool mounted in the cylinder for movement between the end caps. The spool is driven by compressed air that enters the cylinder through passageways in the end caps. Reduced diameter sections of the spool interconnect different pairs of logic holes depending on the position of the spool in the cylinder. Accessories mounted in the cylinder in place of the end caps equip the valve for visible spool position indication, spring-driven spool return and low-pressure signal spool actuation.

3,618,637

ROTARY MIXING VALVE

Louis S. Santomieri, Benicia, Calif., assignor to Deseret Pharmaceutical Company, Inc., Sandy, Utah

Filed Feb. 4, 1970, Ser. No. 8,568
Int. Cl. F16k *19/00*
U.S. Cl. 137—625.41 1 Claim



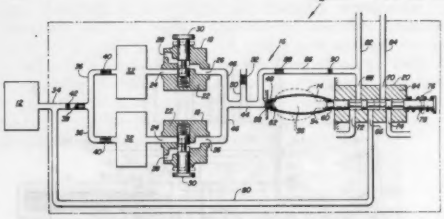
Apparatus and method for conducting any selected one or combination of a plurality of available fluids to an infusion tube, the apparatus having a hollow housing with a plurality of radially spaced fluid input sites and a single core having an effluent passageway, the core being displaceable relative to the housing to bring the passageway serially into fluid communication with the inlet sites. A bypass may be formed between the core and the interior wall of the housing at at least one input site so that one fluid may be mixed with another at the input site prior to passage of the mixed fluids into the effluent passageway.

3,618,638

PNEUMATIC CONTROL APPARATUS

John M. Yarlott, Harvard, and Clyde A. Abbott, Still River, both of Mass., assignors to Trish Energetics, Inc., Harvard, Mass.

Filed June 1, 1970, Ser. No. 42,293
Int. Cl. F16k *11/07*; F16b *19/04*; F15b *15/10*
U.S. Cl. 137—625.66 12 Claims



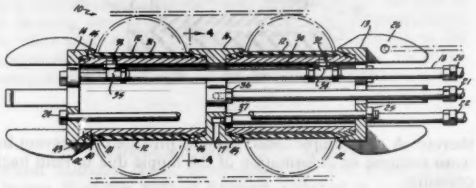
A pneumatic two-hand control apparatus for a machine or the like including a pressure-responsive actuator and a pneumatic control circuit comprising a servomechanism for operating an associated spool valve. A pair of manually operable actuating valves connected in parallel relation in the circuit between the actuator and a pressure source are arranged for substantially simultaneous operation to release pressure from a pair of pressure accumulators to produce a resultant pressure pulse of sufficient magnitude to operate the actuator. The actuator comprises an axially elongated flexible tin-walled shell defining a pressure chamber of variable volume adapted for radial expansion and axial contraction in response to increase in pressure therein.

3,618,639

PACKER FOR SEALING PIPE LEAKS

Daniel R. Daley, Orlando; Clark J. Crooker, Windermere, and Thurman Soles, Orlando, all of Fla., assignors to Cues, Inc., Orlando, Fla.

Filed Nov. 24, 1969, Ser. No. 879,256
Int. Cl. F16l *55/10*, *55/18*
U.S. Cl. 138—97 6 Claims



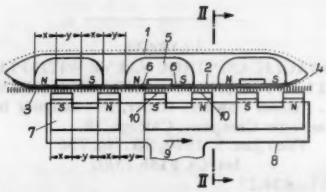
A packer apparatus for the internal sealing of pipe leaks is made up of easily assembled and disassembled components. A pair of casings is covered with inflatable skins and have a center ring between them and an end skid member at each end of the mechanism. Bolts connecting the two end members tighten the mechanism together in a manner to seal both ends of the inflatable skins covering the casings so that both skins may be inflated on either side of the center ring and when inside a pipe to provide a void area for rapid grouting by the passing of chemicals through the center ring. Thus the unit may be easily assembled and disassembled by the attachment and removal of the bolt between the end of the mechanism whereby parts may be easily replaced in the field and the inflatable skin does not have to have holes therein for anchoring it to the casing.

3,618,640

MAGNETIC SHUTTLE DRIVE FOR CONTINUOUSLY PROGRESSING SHEDS IN WEAVING LOOMS

Adolf Linka, Kaiserstrasse 91, 7417 Pfullingen, Germany

Filed Aug. 12, 1969, Ser. No. 849,342
Claims priority, application Germany, Aug. 16, 1968, P 17 85 147.7
Int. Cl. D03d *49/44*, *41/00*, *49/60*
U.S. Cl. 139—134 6 Claims



The shuttle is supplied with permanent magnets having uniform spacing, and alternate poles; the travelling magnetic field is formed by a carrier holding a plurality of magnets of similar size and spacing to that of the magnets on the shuttle, so that, upon movement of the carrier, the shuttle will be carried along and attractive and repelling force components between shuttle and travelling field will cancel, and force components in the direction of the movement of the shuttle along the shuttle race will be additive.

3,618,641

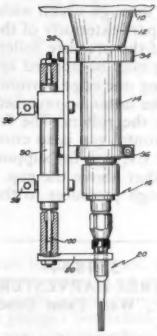
WIRE-WRAPPING TOOL

Daniel T. Hannify, 89 Canario Drive, Warren, R.I.

Filed Feb. 10, 1970, Ser. No. 10,262
Int. Cl. B21f *15/00*
U.S. Cl. 140—124 4 Claims

A wire-wrapping device having a bit assembly so constructed as to allow the wire to be laterally positioned

directly into the radially offset groove that runs axially along the periphery of the bit. An inner sleeve surrounds the bit and has a helical slot into which is keyed a pin extending radially outward from the bit, the lower end of the inner sleeve having an axial slot open at its bottom that aligns with the offset groove of the bit allowing the wire to be laterally positioned therethrough. An outer sleeve surrounds the inner sleeve and also has an axial slot open at its bottom and aligned with the groove in the bit. The outer sleeve is



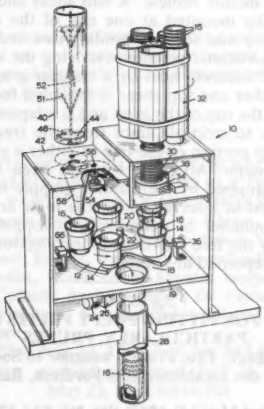
restrained from rotational and axial movement. The inner sleeve is moved axially upward by the drive fork after the wire is placed in the groove. The axial movement causes the inner sleeve to rotate due to the camming action of the pin keyed in the helical slot thereby closing the groove in the bit and clamping the wire therebetween. The bit assembly may then be lowered over a terminal which extends upwardly into the terminal receiving opening of the bit and the wire wrapping device is ready to operate.

3,618,642

COFFEE-PACKAGING MACHINE

Jean-Guy Beaulieu, Boucherville, Quebec, Canada, assignor to General Foods Limited, Toronto, Ontario, Canada

Filed June 8, 1970, Ser. No. 44,439
Claims priority, application Canada, June 9, 1969, 053,755
Int. Cl. B65b *43/44*
U.S. Cl. 141—1 **10 Claims**



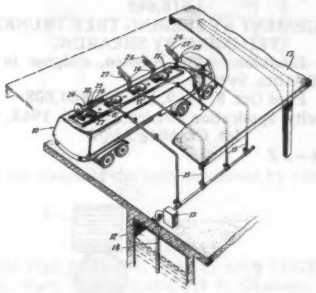
This invention relates to the packaging of granular material, such as coffee, in the bottom of a series of stacked cups and has special use in the dispensing of coffee into cups in this fashion for the subsequent making of a coffee beverage. The machine consists of a table and a jig for receiving the cups overlying the table. The cups are dropped into the jig and the jig moves the cups across the surface of the table and then over the edge of the table into a stacked form. As the cups move over the table, predetermined quantities of coffee are dropped into the cups so that, when they are subsequently stacked, each cup has a predetermined amount of instant coffee in the bottom. In use, one takes a cup from the stack and adds water as required to make a cup of beverage.

3,618,643

CONTAINER-FILLING APPARATUS

John A. Thomson, Havant, and James Carter, London, both of England, assignors to Burmah Oil Trading Limited, London, England

Filed Dec. 29, 1969, Ser. No. 888,317
Claims priority, application Great Britain, Dec. 30, 1968, 61,676/68
Int. Cl. B65b *1/30, 3/28;* **B67d** *5/372*
U.S. Cl. 141—198 **18 Claims**



A loading bay for filling the compartments of a vehicle with liquid fuel has a loading arm for each tank compartment. Each loading arm includes a nozzle and a solenoid operated shutoff valve for controlling the flow of liquid fuel through the nozzle, and is associated with a corresponding overfill protection device which is arranged to operate the shutoff device to prevent flow of liquid fuel through the nozzle when the level of liquid in the corresponding tank compartment reaches a predetermined maximum level. The overfill protection device has a normally open electric switch in series with a normally closed pressure operated electric switch and another normally open electric switch mounted on the loading arm. The normally closed pressure operated switch is positioned at one end of a tube which depends into the tank compartment with the other end open and lowermost when the overfill protection device is mounted on the tank vehicle during filling of the tank compartment and the two normally open switches are closed when the loading arm and the associated overfill protection device are positioned for a filling operation. The arrangement is such that liquid fuel is supplied to the tank compartment through the nozzle only when all three switches are closed and the action of liquid fuel in the tank compartment rising to the predetermined maximum level increases the pressure in the tube until the normally closed pressure operated switch is opened. The electric circuits including the switches of each overfill protection device and controlling the operation of the corresponding solenoid-operated shutoff valves are connected electrically in parallel so that operation of one overfill protection device to prevent the supply of further liquid fuel to the corresponding tank compartment has no influence on the supply of liquid fuel to the other tank compartments.

3,618,644

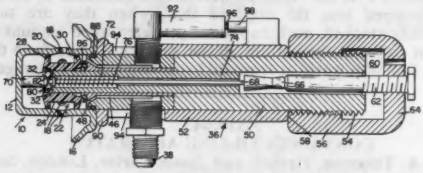
RECIPROCAL VALVE AND ACTUATOR

Frederick G. J. Grise, West Brookfield, Mass., assignor to Novelty Tool Company, Inc., Spencer, Mass.

Filed Feb. 16, 1970, Ser. No. 11,582
Int. Cl. F25b *45/00*
U.S. Cl. 141—348 **6 Claims**

A balanced reciprocal valve comprising a one-piece, e.g., plastic member in the form of a hollow open-ended barrel

having an annular outstanding seal at each end thereof, this valve member being adapted to be placed in a charging cap or thimble having openings for passage of fluid material, and



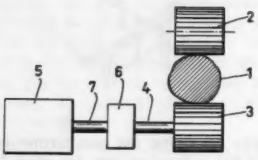
a tool for placing the valve member in closed position wherein the openings in the cap are between the two seals, and selectively in open position so that the openings are clear of the valve member for passage of fluid in either direction.

3,618,645

ARRANGEMENT AT FEEDING TREE TRUNKS FOR TRIMMING BY SHEARING

Karl Thore Lindblom, Alfta, Sweden, assignor to Ostbergs Fabrik AB, Alfta, Sweden

Filed Oct. 8, 1969, Ser. No. 864,808
Claims priority, application Sweden, Oct. 10, 1968, 13668/68
Int. Cl. A01g *23/02*
U.S. Cl. 144—2 Z **2 Claims**



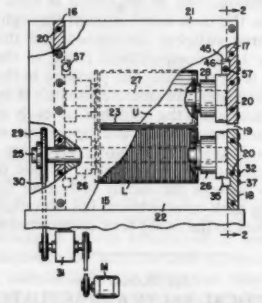
Device for feeding tree trunks for delimbing including a set of feed rollers, a constant speed drive motor, and a torque converter interposed between the motor and the feed rollers.

3,618,646

MEANS FOR PRESSURE-CONDITIONING WOOD VENEER FOR APPLICATION TO CONTOURED CORES

Raymond H. Lewis, Fort Lauderdale, Fla., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Division of Ser. No. 677,495, Oct. 9, 1967, Pat. No. 3,541,592.
Filed July 10, 1970, Ser. No. 53,790
Int. Cl. B27d *3/00*
U.S. Cl. 144—282 **7 Claims**



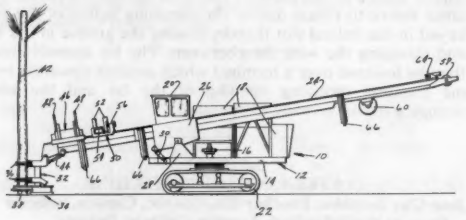
Wood veneer to be bent is subjected initially, along closely spaced lines parallel to its grain, to pressures of many tons p.s.i. which disrupt its fibrous structure. The special mechanism for this purpose embodies a pair of rollers, one being circumferentially scored to impress relatively deep score lines in one face of a veneer strip which is fed between the rollers when rotated. The bearings for these rollers are supported in upstanding walls of a framework to be rested firmly upon or against extended areas of horizontal faces thereof whereby to be adequately braced against the thrust forces proceeding from the rollers when pressure engaging the veneer strips passed between them. The upstanding frame walls are spaced apart sufficiently to successively accommodate between them many veneer strips of normal widths. For accommodation of wider strips, however, one frame wall is made of two sections, one above the other with a horizontal gap therebetween through which wider veneer strips may be extended to lie in part exteriorly of the frame and beyond the proximate ends of the pressure rollers. This operation of pressure conditioning may be applied to a relatively narrow area of each strip along one edge portion thereof, or to wider areas of the strip if the latter be reversed and subjected to a second pass between the rollers. The frame so provided in one wall with a horizontal gap is so constructed and braced as to retain adequate strength for support of the two rollers, one below and the other above the gap, that its capacity for application of very high pressures to the veneer strip is assured.

3,618,647

TREE HARVESTER

Virgil C. Stuart, Jr., West Palm Beach, Fla., assignor to Owens-Illinois, Inc.

Filed Nov. 19, 1969, Ser. No. 877,937
Int. Cl. A01g *23/02*
U.S. Cl. 144—309 AC **5 Claims**



A novel and improved tree-harvesting method and apparatus adapted to cut, delimb, top, transport and deposit a plurality of trees in a stack at a desired collection point. The tree harvester features a horizontally oriented mast which is mounted on a mobile vehicle. A butt shear and felling grapple are pivotally mounted at one end of the mast and are adapted to grasp and sever a standing tree and pivot it to a substantially horizontal position overlying the mast where it is grasped and securely held by a transfer grapple. A combination delimber and top shear is mounted for longitudinal movement on the top of the mast and is adapted to be driven along the tree to strip all limbs from the tree and also to remove the top portion of the tree at either a predetermined length or diameter. After the tree has been delimbed and topped, it is dropped by the transfer grapple into collection arms positioned at intervals along the mast and adapted to hold a large number of delimbed and topped trees to be transported by the tree harvester to a collection point where the trees are deposited in a stack.

3,618,648

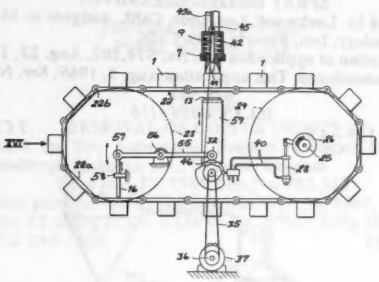
APPARATUS FOR PITTING PULPY FRUITS AND, MORE PARTICULARLY, PRUNES

Jean-Paul A. Becq, Pau, France, assignor to Societe anonyme dite, Societe des Etablissements Fordimit, Basses-Pyrenees, France

Filed May 14, 1969, Ser. No. 824,579
Claims priority, application France, May 17, 1968, 152,238
Mar. 19, 1969, 6,907,847
Int. Cl. A23n *3/04*
U.S. Cl. 146—17 A **17 Claims**

An apparatus for the depitting of pulpy fruit especially prunes wherein a multiplicity of cup-shaped dies each having

a relatively wide mouth and a narrow aperture opposite the mouth and defined by a resilient membrane to pass the pit or stone. The cups, which have interior cavities conforming to surfaces of revolution, receive an axially displaceable plunger



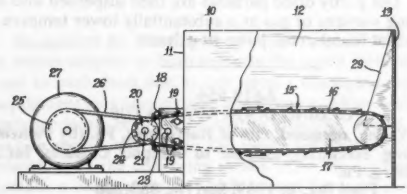
which pierces the fruit in the cup and drive the pit or stone out through the narrow opening. A membrane below the opening has resilient walls which permit the pit to be forced therethrough by the plunger but retain the meat of the fruit in the cup. Means is provided to reshape the depitted fruit.

3,618,649

HAY BALE CUTTER

Edward L. Benno, Route 1, Box 198, Grayslake, Ill.

Filed Feb. 26, 1970, Ser. No. 14,534
Int. Cl. A01f *29/00*
U.S. Cl. 146—70.1 **4 Claims**



A hay bale slicing machine comprising spaced, endless cutters mounted so as to extend into a hopper in cantilevered fashion, an anticlogging deflector disposed between said cutters and at one end thereof.

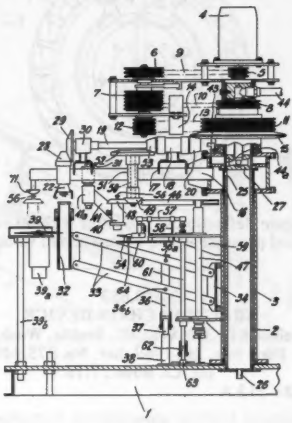
3,618,650

APPARATUS FOR PREPARING THE RECEPTACLES AND FRUITS OF BRACTATED PLANTS, MORE PARTICULARLY ARTICHOKES

Jacques Francois Robert Proubet, Le Clayes, Bois, Yvelines; Charles Gustave Amicel, Carrieres, Seine, Yvelines; Michel Jules Jacquot, Beynes, Yvelines; Pierre Baptistal, Paris, and Roger Buvelot, Paris, all of France, assignors to Societe D'Interet Collectif Agricole March De Vente Aux Encheres Du Nord-Finistere, Kerisnel Saint-Pol-de-Leon, Finistere-Nord, France

Filed July 23, 1969, Ser. No. 844,143
Claims priority, application France, July 26, 1968, 160,741, May 23, 1969, 6,916,926
Int. Cl. A23n *15/04*
U.S. Cl. 146—81 **23 Claims**

This invention relates to an apparatus for preparing the receptacles and fruits of bractated plants, more particularly artichoke bottoms, comprising a support for the receptacle; a blowing head for removing the leaves and the choke from the receptacle; sucker means for picking up the receptacle bottom from the support after such bottom has been cleaned by the blowing head; and machining means for removing irregularities in the shape of the bottom caused by removal of the leaves.

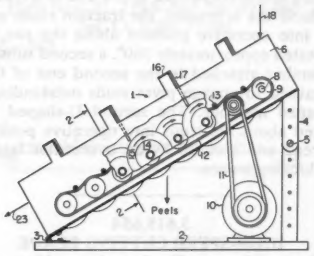


3,618,651

SYSTEM FOR PEELING FRUITS AND VEGETABLES

Marcus R. Hart, Concord; Robert P. Graham, El Cerrito; Charles C. Huxsoll, San Pablo, and Gerald S. Williams, Berkeley, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Nov. 3, 1969, Ser. No. 873,220
Int. Cl. A23n *7/00*
U.S. Cl. 146—226 **3 Claims**



Fruits or vegetables are treated (e.g., with lye) to loosen the peel, and the loosened peel is removed by nonabrasive dry wiping with rotating discs of soft flexible rubber.

3,618,652

SHOCK ABSORBER

Kenneth D. Marshall, W. Richfield, Ohio, and John W. Melvin, Ann Arbor, Mich., assignors to The B. F. Goodrich Company, New York, N.Y.

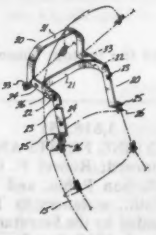
Filed Jan. 15, 1970, Ser. No. 3,019
Int. Cl. B60b *9/18*
U.S. Cl. 152—5 **9 Claims**

A closed fluid-containing vessel subject to deflection in response to changes of load thereon, for example an inflatable vehicle tire, adapted to be filled with a substantially incompressible fluid, is rendered capable of absorbing impacts by having a distensible elastomeric tube mounted externally

of the member and communicating with the interior thereof. The tube wall bulges to accommodate fluid displaced from

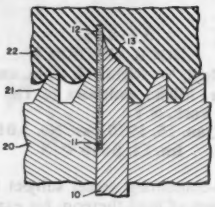
the vessel upon deflection of the latter without substantial increase of fluid pressure above a preselected value.

3,618,653
TRACTION CHAIN DEVICE
Peter M. Stellas, 617 3rd Ave., W., Seattle, Wash.
Filed Nov. 10, 1969, Ser. No. 875,449
Int. Cl. B60c 27/10
U.S. Cl. 152—213 A **9 Claims**



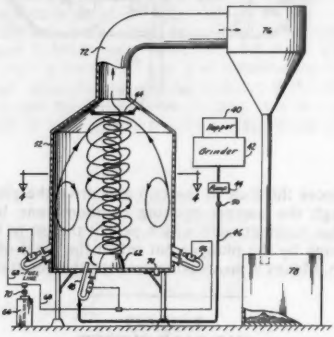
An apparatus for applying and securing a vehicle traction chain is described. A first substantially U-shaped clip member constructed of a material having spring-type characteristics is adapted to engage each of the sidewalls of an automobile tire and is connected to one end of a traction chain. As the vehicle tire is rotated, the traction chain apparatus is emplaced into operative position about the tire. When the tire has rotated approximately 360°, a second substantially U-shaped member attached to the second end of the traction chain is caused to engage pivot studs outstanding from the first U-shaped member. The second U-shaped member is then rotated about the studs into operative position against the tire tread and secured by an overcenter latch arrangement and locking means.

3,618,654
HIGH-SPEED CUTTING BLADE
Forrest Clayton Meserve, North Andover, Mass., assignor to Bandag Incorporated, Muscatine, Iowa
Filed Aug. 28, 1969, Ser. No. 853,768
Int. Cl. B29h 21/08; B26d 1/00, 9/00
U.S. Cl. 157—13 **2 Claims**



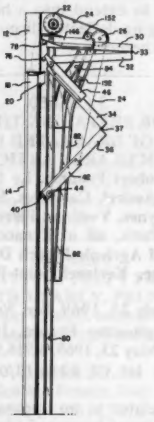
A blade for cutting plastic material such as tire stock, having a body of steel with a flat back surface with a segmental channel in one edge containing a ring of tungsten carbide or the like ground flush with the steel body on one side and projecting outwardly so that it is exposed on both sides and terminates in a circular cutting edge.

3,618,655
SPRAY DRYING APPARATUS
Raymond M. Lockwood, Los Altos, Calif., assignor to Marine Technology, Inc., Beverly Hills, Calif.
Continuation of application Ser. No. 574,202, Aug. 22, 1966, now abandoned. This application Aug. 5, 1969, Ser. No. 849,589
Int. Cl. B01d 1/16
U.S. Cl. 159—4 E **7 Claims**



The apparatus and method of this invention pertains to the atomizing of a paste or slurry, and the drying thereof to produce a meal or powder. A paste or slurry of material to be dried is introduced into a pipe, such as the exhaust pipe of a pulse jet engine, in which the cycling reversing flow of gases atomizes the paste or slurry and rapidly dries the resulting particles. The partly dried particles are then dispensed into a tank having vortices of gas at a substantially lower temperature than that found in the pulse jet exhaust.

3,618,656
FOLDING DOOR APPARATUS
John C. Young, deceased, late of Harrisburg, Pa. (by Pamela A. Young, executrix), assignor to Compact Closures, Inc., Harrisburg, Pa.
Filed Dec. 8, 1969, Ser. No. 883,208
Int. Cl. E05f 11/54
U.S. Cl. 160—189 **8 Claims**



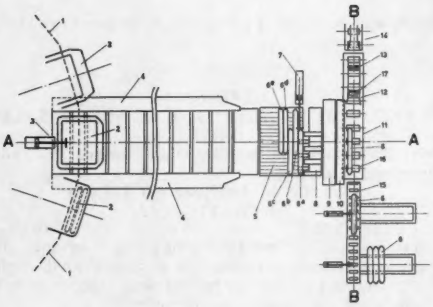
Folding door apparatus including at least four foldable panels hinged together in accordion fashion for vertical

movement relative to the opening of a structure such as a garage; each pair of door panels have roller mountings disposed in vertically arranged trackways on each side of the opening.

ERRATUM

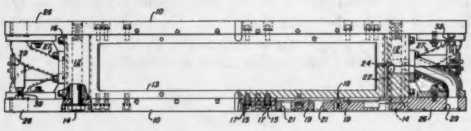
For Class 164—148 see:
Patent No. 3,618,668

3,618,657
REMOVAL OF COPPER INGOTS
Edouard De Bie, Antwerpen, Belgium, assignor to N. V. Metallurgie Hoboken S.A., Brussels, Belgium
Filed Dec. 12, 1968, Ser. No. 783,343
Claims priority, application Belgium, Dec. 14, 1967, 52099
Int. Cl. G01g *13/00*; **B22d** *45/00, 47/00*; **B65g** *19/00*
U.S. Cl. 164—269 **12 Claims**



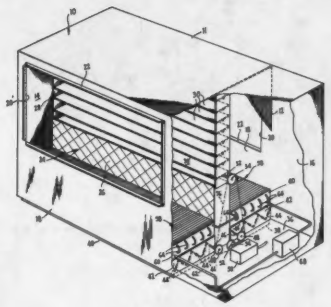
Equipment for clearing away copper ingots which includes a means adapted to both separate the ingots from each other and to push them one by one upon a conveying means. The equipment may also include a weighing machine which works independently both of the casting machine and of the conveying means and weighs the ingots before they have been placed upon the conveying means. Also the equipment may include a chain elevator which is used for separating the ingots from each other, an air piston, and an auxiliary conveying means for conveying faulty ingots.

3,618,658
CONTINUOUS-CASTING MOLD
Francis Gallucci, North Huntingdon Township, Westmoreland Co., Pa., assignor to United States Steel Corporation
Filed Oct. 6, 1969, Ser. No. 863,878
Int. Cl. B22d *11/02*
U.S. Cl. 164—281 **5 Claims**



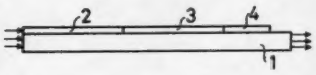
A mold for continuous-casting of metals in which the copper liner can be one-piece construction or four-piece construction used interchangeably. Both forms of liners have their own advantages. The invention enables either form to be used in the same mold.

3,618,659
ENVIRONMENTAL CONDITIONING SYSTEM AND METHOD
Davis I. Rawal, 105 White St., Waterbury, Conn.
Filed Apr. 6, 1970, Ser. No. 25,834
Int. Cl. F28
U.S. Cl. 165—1 **10 Claims**



An environmental conditioning method removes stale air and replaces it, at least in part, with fresh air at volumetric rates that are substantially the same. The stale air from the room is delivered to a return damper with a kinetic energy level of substantially zero, and the volumetric rate of airflow from and to the room is substantially independent of the volume of air removed and replaced. A modular damper unit may be employed, which provides heat exchangers for conservation of heat energy, and the system provided is readily adapted for centralized, overall environmental conditioning by the incorporation of heating, cooling, cleaning and humidity control means therein.

3,618,660
HEAT TRANSFER DEVICE
Claus Busse, Laveno, Italy, assignor to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg
Filed Nov. 21, 1969, Ser. No. 878,669
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **10 Claims**

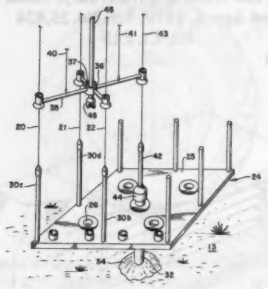


A heat pipe of the kind having a heat-carrying vehicle such as a metal which circulates inside a closed pipe with a cycle of evaporation and condensation is provided with one or more auxiliary heat pipes for use, in starting up from cold, to melt the vehicle of the main heat pipe.

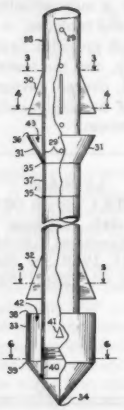
3,618,661
APPARATUS AND METHOD FOR DRILLING AND PRODUCING MULTIPLE UNDERWATER WELLS
Charles P. Peterman, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 850,463
Int. Cl. E21b *7/12*
U.S. Cl. 166—.5 **11 Claims**

Apparatus and method for drilling and producing multiple underwater wells wherein drilling and production template means is remotely lowered and installed at an underwater location. The template means comprises a plate having a plurality of holes therein through which underwater well drilling operations may be carried out. A plurality of guideposts on

the template means and guidelines associated therewith are utilized to lower into position the various drilling and production components operatively associated with each of the wells.



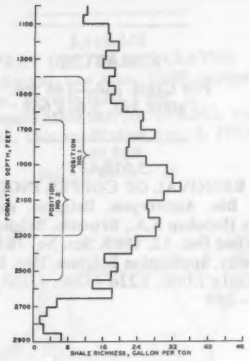
3,618,662
GAS ANCHORS
Harry G. Cambern, 1715 Beech, Pampa, Tex.
Filed Nov. 18, 1970, Ser. No. 90,508
Int. Cl. F21b *43/00*
U.S. Cl. 166—105.5 **6 Claims**



A gas anchor in combination with a downhole pump. The anchor has an upper terminal end connected to a pump intake and a lower terminal end in the form of an inverted cone from which there upwardly depends a skirt member which forms an annulus therebetween. An inverted frustum of a cone circumferentially encloses a marginal portion of the tubular body and forms a conical annulus therebetween with the second annulus being spaced apart from the first annulus by guide means. Apertures placed in communication with each annulus provides a liquid flow path to the pump to enable gas to be separated from liquid as flow occurs into the tubular body.

3,618,663
SHALE OIL PRODUCTION
Riley B. Needham, Bartlesville, Okla., assignor to Phillip Petroleum Company
Filed May 1, 1969, Ser. No. 820,777
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—247 **5 Claims**

A nuclear device is positioned in a shale oil formation and detonated to produce a chimney of fractured oil shale with lean shale at the bottom and rich shale near the top of the chimney and producing shale oil by retorting with a heated gas, preferably at a low temperature for a prolonged period followed with retorting at a higher temperature to yield shale oil.



3,618,664
OIL RECOVERY METHOD USING AN AQUEOUS FLUID DRIVE
Robert R. Harvey, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 16, 1969, Ser. No. 825,403
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **10 Claims**

Oil is produced by fluid drive using a slug in advance of the drive which contains a suspension of minute solids such as carbon black and at least one polyethylene oxide-type surfactant plus a polysaccharide-type viscosifier.

3,618,665
STIMULATION AND SELECTIVE PLUGGING OF PETROLEUM RESERVOIRS CONTAINING KAOLINITE
Richard S. Fulford, Tulsa, Okla., assignor to Cities Service Oil Company
Filed Nov. 26, 1969, Ser. No. 880,390
Int. Cl. E21b *43/27*
U.S. Cl. 166—294 **7 Claims**

Fractures or highly permeable streaks in a reservoir containing kaolinite are selectively plugged by the introduction of a solution containing a metallic salt of an organic acid. The solution attacks the kaolinite containing particles of the fractures or permeable streaks and decomposes the clay mineral bonds of the rock matrix. The decomposition process causes the walls of the pores to disintegrate and form individual grains of fine clay particles. Subsequent addition of treatment solution transposes the disintegrated particles and lodges them in the exposed pores of the fractures or permeable streaks. Further flow through the treated area is restricted and the reservoir is selectively plugged. Less permeable areas of the reservoir are somewhat stimulated by the kaolinite breakup with the dislodged clay particles from those areas seeking the more permeable channels in the reservoir and further plugging them. The reservoir is thereby both selectively plugged and stimulated by the solution treatment and the reservoir performance is enhanced.

3,618,666
STEAM INJECTION OF OIL FORMATIONS
Alvin E. Sayers, Lloydminster, Alberta, Canada, assignor to Petrolite Corporation, Wilmington, Del.
Filed Jan. 12, 1970, Ser. No. 2,351
Int. Cl. E21b *43/20*
U.S. Cl. 166—303 **2 Claims**

In the process of stimulating the production of petroleum from underground formations by treating the formation with

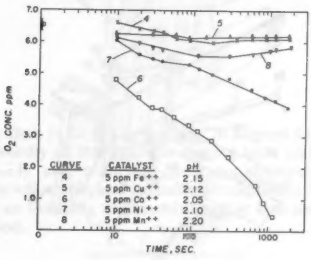
steam, including steam flooding and the "huff and puff" steam soak techniques, the improvement which is characterized by the use of organosilicones in conjunction with steam.

3,618,667

REMOVAL OF DISSOLVED OXYGEN FROM WATER

Earl S. Snavely, Jr., Arlington, Tex., assignor to Mobil Oil Corporation

Filed Mar. 6, 1970, Ser. No. 17,279
Int. Cl. C02b *1/18;* E21b *43/22*
U.S. Cl. 166—310 13 Claims



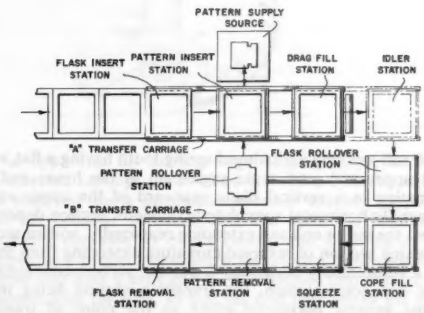
This specification discloses a method of treating water which contains hydrogen sulfide and oxygen dissolved therein to retard the corrosion of metal in contact with the water. A transition metal is added to the water which transition metal catalyzes the reaction between hydrogen sulfide and oxygen, thereby removing the oxygen from the water.

3,618,668

APPARATUS FOR AUTOMATIC MATCHPLATE MOLDING

George T. Dupre', 417 South Elm, Palatine, Ill., and Thomas M. De Marco, 3359 North Austin Ave., Chicago, Ill.

Filed May 18, 1970, Ser. No. 38,166
Int. Cl. B22c *25/00*
U.S. Cl. 164—148 22 Claims



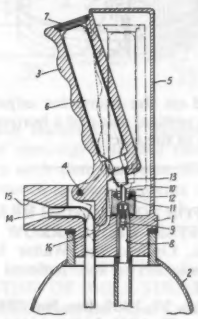
Method for continuous preparation of molds from mold flasks, matchplate mold patterns and mold-forming material, wherein flasks are assembled with flask drag section atop pattern and flask cope section, the drag section is filled with mold-forming material, the entire flask is inverted, the cope section is filled, and the pattern is removed, inverted and made available for use with other flask sections. Multistation apparatus for mass production according to the method. Jolt apparatus employing double-shaft contrarotating motors as a source of mechanical agitation for compacting mold-forming material in flask.

3,618,669

APPARATUS FOR CONTROLLING THE FLOW OF EXTINGUISHING MEDIUM FROM A FIRE EXTINGUISHER

Frederic Sachs, Neuilly-sur-Seine, France, assignor to Compagnie Centrale Sicli Societe Anonyme, Le Blanc-Mesnil, France

Filed Jan. 9, 1970, Ser. No. 1,640
Claims priority, application France, Feb. 7, 1969, 6902832
Int. Cl. A62c *11/00*
U.S. Cl. 169—31 3 Claims



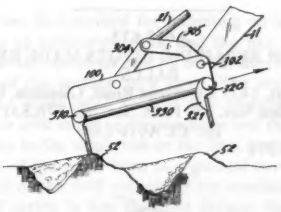
The head of the fire extinguisher carries a pivoting handle enclosing a sparklet adapted to be shifted first into an operative position for which the sparklet engages a hollow striker opening with a container enclosing the extinguishing medium. At the same time a projection on said handle crushes the yielding pipe connecting the container with the projecting nozzle. This subjects the container to the pressure of the sparklet gas and any further rocking of the sparklet in the opposite direction releases the yielding pipe so as to allow the projection of the extinguishing medium at the desired rhythm.

3,618,670

MULTIPLE PLANT OR SHRUBBERY HOLE PRODUCING APPARATUS

Joseph F. Alberto, East Islip, N.Y., assignor to Dapa Research Corp., New York, N.Y.

Filed Oct. 17, 1968, Ser. No. 768,386
Int. Cl. A01b *35/32*
U.S. Cl. 172—60 9 Claims



An apparatus for producing holes consisting of a transverse beam having spaced toothed-sections therealong and mechanically actuated control means therefor.

3,618,671

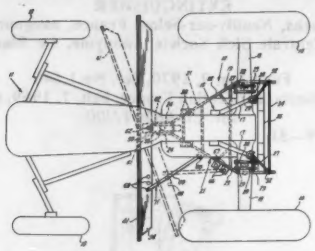
GRADER ATTACHMENT FOR A TRACTOR

Alfred Chantland, Humboldt, Iowa

Filed Nov. 5, 1969, Ser. No. 874,156
Int. Cl. A01b *59/04;* E02f *3/12*
U.S. Cl. 172—297 4 Claims

The grader blade of the attachment is located between the tractor front and rear wheels and is carried on a frame sup-

ported on the tractor rear axle for pivotal up-and-down movement by the tractor power lift arms. The grader blade is

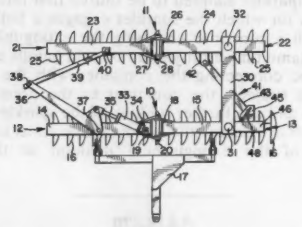


adjustably mounted on the frame for adjustable rotational movements about a vertical axis and a horizontal axis that extends longitudinally of the tractor.

3,618,672
MECHANISM FOR POSITIONING REAR GANG OF OFFSET DISK HARROW

Jerome L. Fueslein, Linden, and Walter Mayer, Stockton, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 29, 1969, Ser. No. 888,686
Int. Cl. A01b *23/04, 15/14*
U.S. Cl. 172—320 **4 Claims**



An agricultural implement having front and rear gangs of earth-working tools being interconnected in such a manner that they may easily be adjusted from a transport to a field-operating position and also laterally adjusted with respect to each other to provide the proper tool relationship between said front and rear gangs of earth-working tools for various field-operating conditions.

3,618,673
TOOL FOR REPAIRING DIVOTS MADE BY GOLF BALLS

Fred C. Gossett, 1437 Cleveland Road, Glendale, Calif.

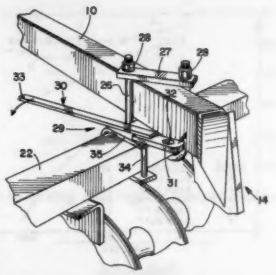
Filed Nov. 18, 1968, Ser. No. 776,531
Int. Cl. A01b *1/00*
U.S. Cl. 172—371 **2 Claims**

A thermoplastic tool for digging into the turf of a golf course to repair a depression in the earth made by a golf ball. The tool has a V-shaped blade portion with a radiused puncture point and an integral handle with a transverse manipulating rib and a depressed area for advertising material in the handle.

3,618,674
TOOL FOR ADJUSTING DISK HARROW GANGS

Robert D. Woodworth, Clarendon Hills, and Eugen J. Birkenbach, Park Ridge, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed July 17, 1970, Ser. No. 55,639
Int. Cl. A01b *65/02, 63/26*
U.S. Cl. 172—584 **5 Claims**

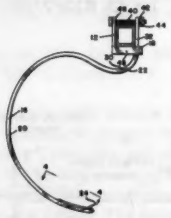


In an agricultural implement such as a disk, harrow, a tool for adjusting the front and rear disk gangs and for securing said disk gangs in the adjusted position.

3,618,675
SPRING TOOTH ASSEMBLY

Michael C. Hornung, Spearville, Kans., assignor to American Products, Inc., Spearville, Kans.

Continuation of application Ser. No. 524,128, Feb. 1, 1966. This application May 7, 1969, Ser. No. 824,742
Int. Cl. A01b *23/02*
U.S. Cl. 172—707 **7 Claims**



A soil-working agricultural spring tooth having a flat, vertical upper end, and acute-angled tip at the lower end terminating in a vertical plane rearward of the upper end, a generally horizontal convoluted connector section depending from the upper end and extending rearwardly, and an arcuate working section of reversed curvature extending from the tip to a substantially horizontal transition section connecting to the connector section, the transition section being in the same general horizontal plane as the point of transition between the upper end and the connector section.

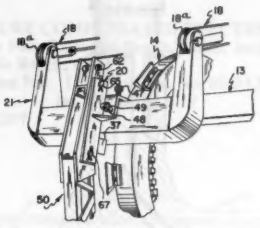
3,618,676
CRUMBING MECHANISM FOR EXCAVATING MACHINES OR THE LIKE

Vincent S. Penote, Shaker Heights, and Melvin K. Rear, Chesterland, both of Ohio, assignors to The Cleveland Trencher Company, Cleveland, Ohio

Filed Nov. 19, 1968, Ser. No. 776,892
Int. Cl. E02f *5/14;* **E02f** *5/08*
U.S. Cl. 172—743 **22 Claims**

A crumbing mechanism for excavating machines including a mounting assembly for detachable connection to the boom

structure of the machine and a crumbing shoe having a boxlike and reinforced bridge construction detachably connected by the mounting assembly to the boom for excavating operations rearwardly of the digging unit of the machine. The mounting assembly includes a selectively adjustable and lockable arrangement for laterally orienting and locking the



crumbing shoe in its active position in aligned following relation rearwardly of the machine digging unit, and the mounting assembly and crumbing shoe conjunctively include a selectively adjustable and lockable arrangement for selectively raising or lowering the crumbing shoe into and out of active position.

3,618,677

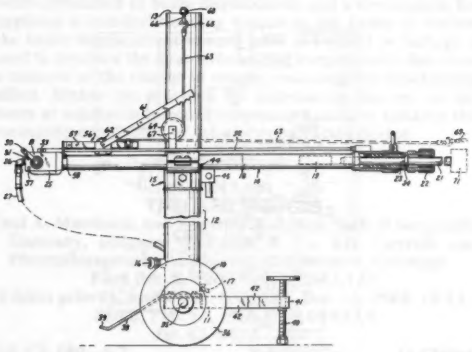
APPARATUS FOR DRIVING FORGE HAMMER KEYS

Nello A. Filippini, Sr., Wilmington, N.C., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,124

Int. Cl. B23p 19/02; B25d 17/30

U.S. Cl. 173—23 **10 Claims**



An apparatus for driving forge hammer keys, having a two-wheeled carriage upon which is fixed a cylinder serving as a reservoir for a pneumatic hammer slidably supported upon the cylinder. A winch mounted upon the hammer is selectively operable to effect raising and lowering of the hammer to a proper operating level relative to the work, or to draw and hold a drift end of the hammer into pressed engagement with the work so that the drift may follow the work as the latter is driven. The carriage provides both mobility and support for the apparatus. Leveling legs are provided on the carriage to effect angular positioning of the apparatus relative to the work.

3,618,678

IMPACT HEAD FOR IMPACT TOOLS

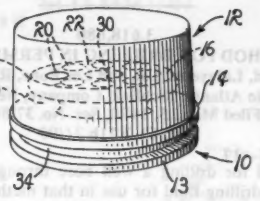
Arthur J. Smith, P. O. Box 3274, Visalia, Calif.

Filed June 19, 1970, Ser. No. 47,768

Int. Cl. B25d 9/00; E21b 1/00

U.S. Cl. 173—131 **11 Claims**

An impact head particularly suited for use with hand-held pneumatically operated impact tools, characterized by a metallic core having a base portion including therein a screw-threaded, axial bore adapted for use in coupling the impact head with an impact tool, and a coaxially related distal portion including a circumscribing annular rib embedded in an impact block formed of an homogeneous mass of synthetic



resin. A particular feature of the impact head resides in an annular array of openings extended through the embedded rib in a manner such that the resin fills the openings and completely surrounds spaced segments of the rib for effectively integrating the core and the block.

3,618,679

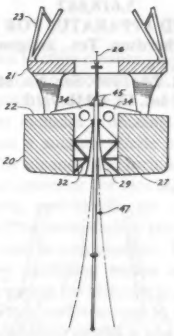
LIMITATION OF DRILL STRING BENDING

Robert C. Crooke, Corona Del Mar, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Sept. 25, 1969, Ser. No. 861,018

Int. Cl. E21b 7/12

U.S. Cl. 175—5 **11 Claims**



A structure is described for mounting on a drilling vessel for drilling of submarine wells and the like. A guide horn beneath the conventional drill rig on the ship is in the form of a portion of the surface of a torus. The drill string passes through the guide horn so that any angular misalignment between the drill string at the sea floor and the drill string at the ship due to the ship's roll or the like, is distributed along the surface of the guide horn as a gradual curve over a sufficient length of the drill string that the maximum fiber stress in the drill string is less than the fatigue limit of the drill string. The guide horn has a small entrance aperture at its upper end adjacent the drill rig and flares in a circular arc to an enlarged exit aperture adjacent the bottom of the ship.

For drilling in deep water, a portion of the guide horn is replaced with an elongated tubular member that surrounds the drill string and is fixed to the ship at its upper end as a downwardly extending cantilevered structure. The elongated tubular member has a gradually diminishing cross-sectional moment of inertia so that the drill string within the tubular member is constrained to bend in a substantially circular arc of large radius. In its more rigid portion, the elongated tubular member has a gradually tapering wall thickness. In its more flexible portion, the elongated tubular member comprises a plurality of axially aligned rings in end-to-end rela-

tion, surrounded by and substantially flexibly interconnected by a cage. The cage has longitudinally extending ribs with each rib having a gradually tapering cross section. The tubular member is compatible with the guide horn so that no structural modifications of the ship are needed for drilling in either shallow or deep water.

3,618,680

METHOD FOR DRILLING IN PERMAFROST

Joe D. Ellard, Lafayette, La., and Lee Bone, Richardson, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed May 15, 1970, Ser. No. 37,860

Int. Cl. E21b *21/00*

U.S. Cl. 175—17 **8 Claims**

A method for drilling a well bore through a permafrost zone and a drilling fluid for use in that method wherein the drilling fluid contains oil, limited amounts of asbestos and/or silica, a limited tolerable amount of water, and the drilling fluid is cooled before use in the drilling method.

3,618,681

WELL DRILLING AND PRODUCTION

Luther E. Bartlett, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,581

Int. Cl. E21b *7/00, 21/04*

U.S. Cl. 175—17 **17 Claims**

A method for drilling a well and for producing a well through a permafrost zone by maintaining at least a part of the well bore in the permafrost zone at a temperature of from about 14° to about 35° F.

3,618,682

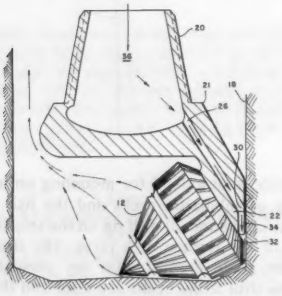
METHOD AND APPARATUS FOR DRILLING

John D. Bennett, Richardson, Tex., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Oct. 24, 1969, Ser. No. 869,083

Int. Cl. E21b *9/10*

U.S. Cl. 175—65 **13 Claims**



A drill bit constructed to provide the simultaneous action of bit teeth mechanically moving the formation and a hydraulic force aiding the movement which is accomplished by channeling fluid down the drill bit cone shank through passages on the face of the cone, and inwardly between the teeth which are in contact with the formation.

3,618,683

BUTTON BIT

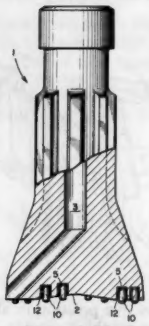
Robert W. Hughes, Easton, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Dec. 16, 1968, Ser. No. 791,532

Int. Cl. E21c *13/00*

U.S. Cl. 175—410 **10 Claims**

A percussive rock drill bit of a type generally known in the art as a button bit wherein a plurality of wear-resistant metal inserts project from the working face of the drill bit. An elastomeric sleeve surrounds that portion of the sides of the insert which is embedded in the bit body. There is metal to



metal contact be between the end of the insert and the bit body for transmitting blow energy from the bit body to the insert.

3,618,684

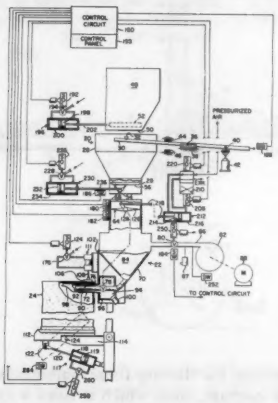
APPARATUS FOR FILLING BAGS WITH WEIGHED DRAFTS OF MATERIAL

Arthur J. Burke, Oakland; Benjamin Martyn, Clifton, and George C. Troost, Prospect Park, all of N.J., assignors to Howe Richardson Scale Company, Clifton, N.J.

Filed Jan. 3, 1969, Ser. No. 788,764

Int. Cl. G01g *13/24*

U.S. Cl. 177—114 **17 Claims**



A bag filling apparatus wherein charges of material are successively weighed out by a scale and dispensed into a feed tank or other suitable receptacle having a spout or nozzle on which an empty bag is mounted. The charge in the tank is selectively discharged into the spout-mounted bag by blowing the charge out of the tank with a large volume of relatively low pressure, high-velocity air. As soon as each charge is dispensed from the scale to the feed tank, the next draft of material is automatically weighed out by the scale and held in the scale until the charge in the feed tank is delivered to the bag. When this occurs, the charge of material in the scale is automatically dispensed into the feed tank, and the scale is automatically operated to weight out the next draft. A control circuit which provides the foregoing automatic operation memorizes the presence of a charge in the feed tank to prevent the charge in the scale from being dispensed before the charge in the tank is delivered to the bag. The circuit also controls operation of a valve at the inlet of the tank to seal

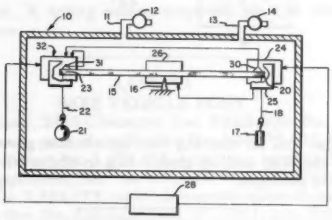
the inlet when pressurized air is admitted to the tank for dispensing the charge. This valve is held closed until the scale has completed each weighing to prevent blowback of pressurized air and consequent interference with the operation of the scale.

3,618,685

TEMPERATURE COMPENSATED ELECTROBALANCE

Owen Orlando Fiet, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 13, 1970, Ser. No. 89,313
Int. Cl. G01g 3/14
U.S. Cl. 177—207 18 Claims



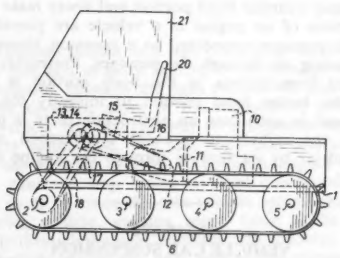
An electrobalance device is provided which includes a beam pivotally mounted at a fulcrum point and further including means for suspending a buoyant body from the beam. The beam, fulcrum and suspended body form a counterbalance scale. A change in the weight suspended from the beam will case the beam to be unbalanced. The device further includes a photoelectric circuit for detecting any such beam unbalance or beam displacement and a servosystem for applying a counterbalancing torque to the beam to reduce the beam displacement toward zero. A current or voltage is used to produce the counterbalancing torque and is therefore a measure of the change in weight producing the unbalancing effect. Means are provided for maintaining the end of the beam at substantially equal temperature so as to enhance the measuring capabilities of the electrobalancing device.

3,618,686

TRACKED VEHICLE

Paul A. Morsbach, and Klaus F. W. Leben, both of Bergedoff, Germany, assignors to Leben & Co. KG Vertrieb von Pistenpflegegeraten fur Skiabfahrten, Munich, Germany

Filed Dec. 8, 1969, Ser. No. 883,133
Claims priority, application Germany, Dec. 16, 1968, 18 14 880.6, Feb. 10, 1969, P 19 06 457.4
Int. Cl. B62d 11/10
U.S. Cl. 180—6.7 11 Claims



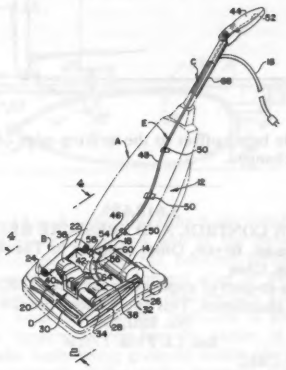
A tracked vehicle, especially for over-snow use in mountainous terrain, particularly for preparing ski runs, is equipped with a steering system by positively driving the two endless tracks at different speeds by two intermediate gear systems controlled by the driver.

3,618,687

POWER PROPELLED SUCTION CLEANER

Melvin H. Ripple; Robert F. Dyer; Brandt F. Ziegler, and Christian D. Berger, all of North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed July 1, 1969, Ser. No. 838,302
Int. Cl. B62d 51/04
U.S. Cl. 180—19 H 11 Claims



A power propelled suction cleaner includes a wheeled trolley having selectively operable torque transmitting means thereon for transmitting torque to surface engaging drive wheels. The cleaner includes a housing covering the trolley and the housing has a suction nozzle and rotatably driven agitator thereon. The cleaner also includes a handle adapted to be grasped by an operator for moving the cleaner over a surface. The housing and handle are each pivotally connected to the trolley for independent pivotal movement relative to the trolley and to one another. The handle includes manually actuatable operating means connected with the torque transmitting means for selectively engaging the torque transmitting means to transfer torque to drive wheels. Automatically operable disabling means is provided for preventing operation of the torque transmitting means by the manually actuatable operating means when the handle is placed in a predetermined pivoted position relative to the trolley. The cleaner further includes disabling means for raising the agitator out of contact with a surface being treated when the handle is placed in a predetermined pivoted position relative to the trolley. The manually actuatable operating means includes a hand grip reciprocatingly connected with the handle. The hand grip has a hollow interior which includes a cavity portion at which force transmitting means is attached. The hand grip includes a closure releasably secured thereto and closing the cavity. The closure may be removed from the hand grip while the hand grip is connected with the handle to provide exterior access to the connection for the force transmitting means.

3,618,688

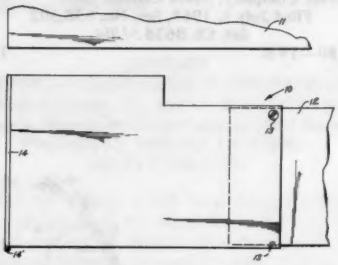
BUMPER ADAPTER FOR WASTE HOSE CONNECTOR

Bernard J. Traut, 792 E. 3rd Ave., Roselle, N.J.

Filed Feb. 24, 1970, Ser. No. 13,364
Int. Cl. F16l 35/00
U.S. Cl. 137—377 4 Claims

An adapter for bumpers on travel trailers. This device serves the purpose of encasing the sewer hose connector

without having to remove it from the hose. This device is of such construction so as to enlarge the end of the bumper



enough while being offset so the striking edge of the bumper will not be changed.

3,618,689

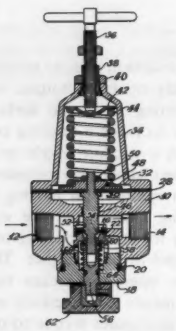
OVERRUN CONTROL AND PRESSURE REGULATOR

Dale F. German, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Continuation-in-part of application Ser. No. 730,340, May 20, 1968, now abandoned. This application Nov. 28, 1969, Ser. No. 880,798

Int. Cl. F16k *17/20*

U.S. Cl. 137—462 **4 Claims**



An overrun control and pressure regulator with an inlet, an outlet and a fluid flow passage therebetween. A valve seat is provided on each side of the passage to cooperate with separate valves. The valves are interconnected by means of a stem and may be adjustably spaced from one another to control fluid flow rate. The stem is mechanically connected with a spring biased diaphragm on the outlet side of the regulator. The diaphragm is biased by an adjustable spring against outlet fluid pressure to provide for fluid regulation. If pressure on the outlet side of the regulator is suddenly decreased, the valves operate as an overrun control to terminate fluid flow through the regulator. A reset bypass is provided from the inlet side to the outlet side of the regulator.

3,618,690

DAMPING AND AIR-PURGING MEANS FOR RELIEF VALVE

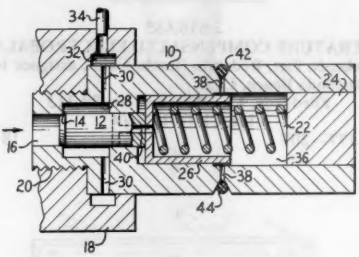
Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 20, 1969, Ser. No. 826,093

Int. Cl. F16k *21/10*

U.S. Cl. 137—514.7 **2 Claims**

A spring-closed relief valve in which the spring chamber receives liquid escaping past the valve to act as a damping medium, the spring chamber is provided with a check valve to permit controlled escape of liquid and purge the system in which the relief valve is used of air entrained in the liquid. The check valve comprises a plurality of passages through a



cylindrical wall all opening into an annular groove circumscribing the wall and an elastic ring in the groove normally closing the passages.

3,618,691

AIR-COOLING APPARATUS FOR AN ENGINE OF A VEHICLE

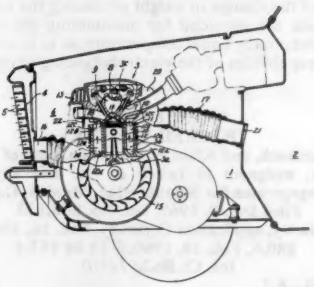
Soichiro Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 9, 1969, Ser. No. 856,454

Claims priority, application Japan, Sept. 9, 1968, 43/64308, Sept. 24, 1968, 43/68844

Int. Cl. B60h *1/16;* **B60k** *11/06*

U.S. Cl. 180—54 A **6 Claims**



The upper cylinder head portion and lower main cylinder body portion of an engine in a vehicle are provided with respective passages connected to a common blower which forces cooling air through the passages. Preferably, the air discharged from outlets in the body portion is directed against the hotter head portion to intensify the cooling thereof, and in such case an obstruction plate is placed in front of the outlets to prevent interference with the discharged air by air flowing through the engine compartment.

3,618,692

VEHICLE CAB SUSPENSION

Larry F. Stikeleather, Hales Corners, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

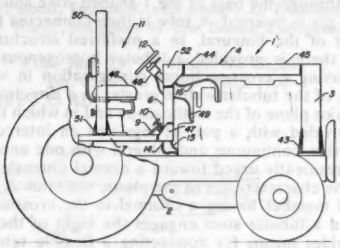
Filed Nov. 4, 1969, Ser. No. 873,929

Int. Cl. B62d *33/06*

U.S. Cl. 180—89 **7 Claims**

An improved vehicle in which a structure extends upward from the front of the vehicle frame. A lateral arm is attached

to the structure and extends rearward, where it is attached to



the cab unit. A spring means suspends the cab above the vehicle frame.

3,618,693

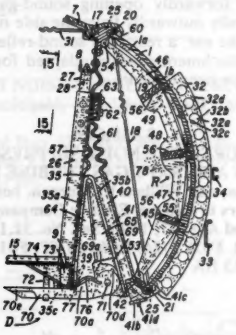
SAFE VEHICLE BODY

Phillip Graham, 2825 Glenmore Ave., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 675,592, Oct. 16, 1967, now Patent No. 3,495,676, which is a continuation-in-part of application Ser. No. 457,627, May 21, 1965, now Patent No. 3,356,175, which is a continuation-in-part of application Ser. No. 226,623, Sept. 27, 1962, now Patent No. 3,219,384, which is a continuation-in-part of application Ser. No. 857,187, Dec. 3, 1959, now Patent No. 3,056,627, and a continuation-in-part of 721,150, Mar. 13, 1958, now Patent No. 3,056,462;, Continuation-in-part of application Ser. No. 557,938, Jan. 9, 1956, now Patent No. 2,916,324; Continuation-in-part of application Ser. No. 557,938, Jan. 9, 1956, now Patent No. 2,916,324; Continuation-in-part of application Ser. No. 449,695, Aug. 13, 1954, Pat. No. 2,826,788. This application Jan. 19, 1970, Ser. No. 3,830

Int. Cl. B60r *21/02*

U.S. Cl. 180—93 **22 Claims**



The invention relates to a safe body for a lightweight automobile that acts to allow survival of its occupants during a violent collision between the light automobile and a heavier vehicle by diverting some of the momentum force of the heavier vehicle into the roadway so it bypasses most of the lightweight automobile. The safe body also acts to severely damage the heavier vehicle. A collision impact against a bumper, causes a stop brace to pivot downwardly to the roadway so as to brace the safe vehicle against the force of the heavier vehicle, causing some force to be diverted diagonally through the stop brace into the roadway. Then the heavier vehicle pushes the light vehicle and causes the stop brace to pivot about its point of contact with the roadway, causing the impacted end of the safe vehicle to be propelled upwardly into a position higher than the position of the impacted end of the heavier vehicle, thus allowing the heavier vehicle to move forwardly by wedging under and carrying the light automobile, rather than to crush it or to push the light vehicle aside. This invention has improvements over the safe vehicle body described in my copending application Ser. No. 675,592, since the improved stop brace coacts with other portions of the safe body to safely cushion and divert collision impact forces in progressive steps.

3,618,694

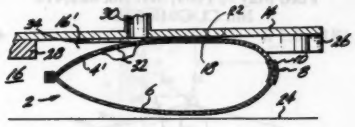
HOP-FREE FLUID BEARING OF SPANDREL INFLATED FLEXIBLE TYPE

Walter A. Crowley, Seattle, Wash., assignor to Aero-Go, Inc., Seattle, Wash.

Filed Oct. 6, 1969, Ser. No. 864,093

Int. Cl. B60v *1/00*

U.S. Cl. 180—124 **13 Claims**



An improved hop-free fluid bearing is disclosed of the flexible type wherein the opposing wall of the flexible annular body is interconnected with the backing member radially outwardly from the inner peripheral edge of the body, and the fluid is discharged into the spandrellike space formed therebetween, both to inflate the body and to pressurize the plenum. The bearing is hop-free by virtue of the inflow openings of the body being grouped within the narrow circumferential segment of the space opposite the inlet, and having an aggregate open cross-sectional area undersized with respect to the inlet, so that a siphoning effect is generated in some of the openings as the fluid travels through the space, there being, however, at least one opening relatively radially offset from the inlet in a region of relatively high static pressure when the body is in a deflated condition, so that the fluid is operative to inflate the body during the initial stage of fluidization.

3,618,695

FLEXIBLE SKIRT ASSEMBLIES FOR AIR CUSHION VEHICLES

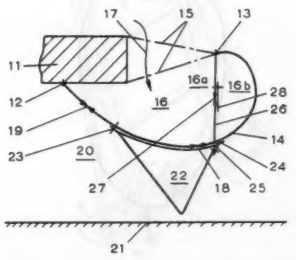
Raymond Leslie Wheeler, Isle of Wight, England, assignor to British Hovercraft Corporation, Limited, Yeovil, Somerset, England

Filed Oct. 13, 1969, Ser. No. 865,563

Claims priority, application Great Britain, Oct. 25, 1968, 50,675/68

Int. Cl. B60v *1/16*

U.S. Cl. 180—128 **5 Claims**



An air cushion vehicle skirt assembly of the kind including an inflated space bounded by a flexible impermeable sheet. The space is subdivided into inner and outer compartments by a substantially vertical impermeable flexible diaphragm. Nonreturn valves in the diaphragm allow pressurized air to flow from the inner compartment to the outer compartment. The vertical diaphragm acts as a tension member to prevent the sheet bounding the lower part of the space extending downwardly more than a predetermined amount and so

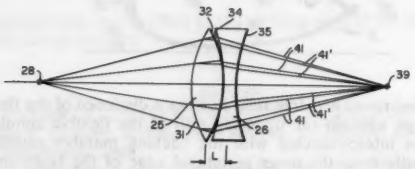
reduces skirt vibration. The pressurized air trapped in the outer compartment by the nonreturn valves provides buoyancy should the body of the vehicle tilt towards the surface of the water. The outer compartment at the forward end of the vehicle is separated from the remainder of the outer compartment by transverse impermeable diaphragms provided with nonreturn valves to permit the entry of pressurized air into that forward part. The space bounded by the flexible sheet may be subtended by a plurality of individual segments attached to the sheets.

3,618,696

ACOUSTIC LENS SYSTEM

Michael J. Hurwitz, Wilkinsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,412
Int. Cl. G01k *11/06*
U.S. Cl. 181—0.5 R **4 Claims**



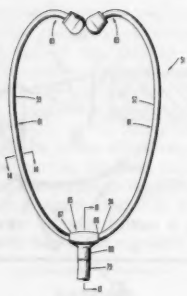
An acoustic lens system having a plurality of acoustic lens elements with the lens elements having respective thermal dispersion factors. The acoustic lens elements are fabricated in accordance with a predetermined relationship of the respective thermal dispersion factors such that the focal length of the acoustic lens system is maintained at a substantially constant value throughout a wise temperature variation. This temperature insensitive result is additionally achieved by a lens system wherein the lens elements are spaced at a precalculated distance from one another.

3,618,697

BINAURAL AND METHOD OF MAKING THE SAME

David Littmann, and Gustav F. Machlup, both of Belmont, Mass., assignors to Minnesota Mining and Manufacturing Company, Village of Maplewood, Minn.

Continuation-in-part of application Ser. No. 643,728, June 5, 1967, now abandoned. This application July 3, 1968, Ser. No. 742,404
Int. Cl. A61b *7/02*
U.S. Cl. 181—24 **22 Claims**



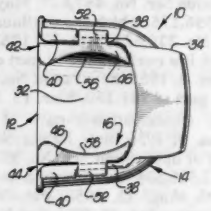
A stethoscope method of making a stethoscope binaural from an elongated resilient tubular member preferably having a symmetrical cross section comprising sliding a tubular T-shaped yoke onto the tubular member, then bending and setting the tubular member and T-shaped yoke in a jig into a substantially symmetrical U-shaped having two legs and a bight with one leg and the adjacent portion of the bight lying substantially in one plane and the other leg in its adjacent portion of the bight lying in a second plane intersecting the first at an angle of 150°. A hole is formed in the tubular member through the base of the T-shaped yoke and a tubular retaining pin is inserted. A tube is then connected to the tubular pin of the binaural. In a preferred structure of the binaural there is provided a tubular homogenous mass of plastic having a cross-sectional configuration in which the thickness of the tubular wall is greater in a direction normal to the major plane of the stethoscope and in which the binaural is provided with a pair of legs and an interconnecting bight section continuous and integral with one another with the legs resiliently urged toward a normal untensioned position by the characteristics of the plastic material. A generally T-shaped member having a channel in the crossmember of the T and a tubular stem engages the bight of the binaural and provides means for connecting a flexible tube in turn connected to a chest piece.

3,618,698

ACOUSTIC DEVICE

Barkman C. McCabe, and John R. Foss, both of Los Angeles, Calif., assignors to Burglar Blast, Inc., Los Angeles, Calif.

Filed Oct. 30, 1969, Ser. No. 872,709
Int. Cl. G10k *11/10*
U.S. Cl. 181—25 **5 Claims**



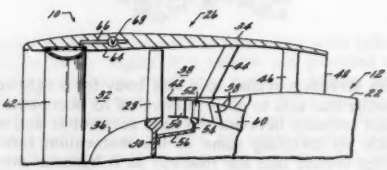
A generally cup-shaped acoustic device attachable over the human ear as a hearing aid. The device is a thin plastic shell having a forwardly opening sound-gathering portion projecting laterally outwardly from the side of the head so as to encompass the ear, a rearward sound-reflecting bowl portion, and an attachment portion adapted for releasably engaging the device over the ear.

3,618,699

MULTIPLE PURE TONE NOISE SUPPRESSION DEVICE FOR AN AIRCRAFT GAS TURBINE ENGINE

Robert C. Evans, and William R. Morgan, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Apr. 27, 1970, Ser. No. 32,197
Int. Cl. F02k *1/26*; B64d *33/02*; F01n *1/08*
U.S. Cl. 181—33 HA **6 Claims**



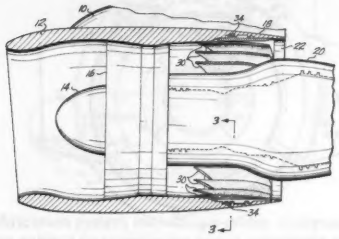
Sound suppression means for a gas turbine power plant which includes a fan positioned within a bypass duct surrounding a core engine which drives said fan. An inflatable diaphragm is positioned within an inlet opening of said bypass duct along the inner wall of the casing which surrounds the fan. Means are provided for selectively inflating said diaphragm such that inlet flow along said inner wall can be increased to sonic or near sonic velocity thereby effectively preventing propagation of multiple pure tone noise generated by said fan from said bypass duct.

3,618,700

RETRACTED NOISE SUPPRESSION SYSTEM

Edwin W. Bond, Issaquah, and Robert L. Lundeen, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 15, 1970, Ser. No. 46,049
Int. Cl. B64d 33/06; F01n 1/08
U.S. Cl. 181—33 HD 4 Claims



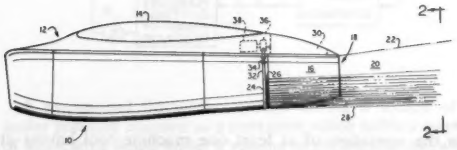
A mechanism for attenuating sound pressure levels in the fluid passageways of an aircraft jet engine comprising a plurality of pivotally attached vane members each having a pair of oppositely facing acoustically treated surfaces. The vane members are stowed for cruise flight in positions aligned along and parallel to the wall of the passageway, wherein fluid flow occurs over only one of said oppositely facing surfaces. The vanes are pivotable along axes parallel to the flow into operative noise suppression positions perpendicular to said wall in which flow occurs over each of said surfaces, thereby increasing attenuation of sound pressure levels in said passageway. The preferred embodiment involves a turbofan jet engine wherein the vane members are stowed along an outer wall in overlapping fashion and the means for pivotally moving the members comprises a power actuated ring member which pivotally displaces each vane into a radial position wherein adjacent vanes cooperate to form trapezoidal acoustic chambers to reflect and dampen sound pressure wave fronts.

3,618,701

JET NOISE-REDUCTION SYSTEM

Howard R. Macdonald, San Diego, Calif., assignor to Rohr Corporation

Filed May 22, 1969, Ser. No. 826,867
Int. Cl. B64d 33/06; F01n 1/14
U.S. Cl. 181—33 HC 6 Claims



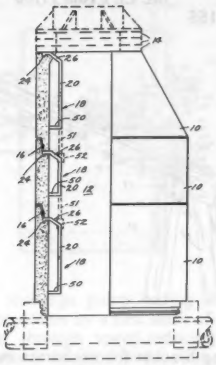
System includes producing temporary shield in form of elongate layer of cold gas extending rearwardly of engine exhaust nozzle in adjacency with lower portion of exhaust gas steam. Shield may be flat but is preferably shaped concave upward to surround lower half of exhaust stream. Shield produced by forcefully projecting a stream of pressurized evaporable fluid which evaporates to form a layer of substantial mass and thickness which reflects at least some sound waves upwardly. Cools and mixes with adjacent exhaust stream to increase mass and cool the stream to reduce sound energy. Mass of shield also absorbs and refracts some of the sound energy. Apparatus is manifold having rear facing outlet means and supplied by pressurized store of liquid or cryogenic fluid carried by nacelle. Pressure pump may be used for liquids such as water.

3,618,702

LADDER SYSTEM FOR INSTALLATION IN MANHOLES

Harold Hendrix, Jr., Dover, and Paul E. Gray, Gnadenhutten, both of Ohio, assignors to United States Concrete Pipe Company, Pittsburgh, Pa.

Filed Apr. 2, 1970, Ser. No. 25,263
Int. Cl. E06c 9/04
U.S. Cl. 182—93 17 Claims



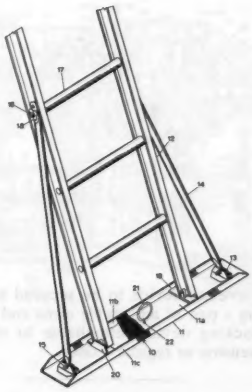
An improved ladder system provides individual ladder sections that can be installed in a manhole made up of individual casing sections. The ladder sections include anchoring elements so that they can be easily installed relative to a casing section in such a way that adjacent casing sections will lock the ladder sections in place. Also, the casing sections and ladder sections are constructed so that installation can be made without any penetration of the casing sections or of the completed assembly.

3,618,703

OUTRIGGER SUPPORTS FOR LADDERS

Reuben Wilke, Antigo, Wis.

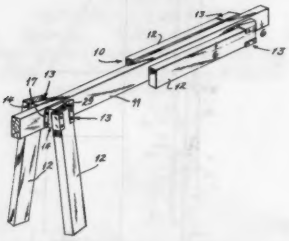
Filed Aug. 19, 1970, Ser. No. 65,145
Int. Cl. E06c 5/36
U.S. Cl. 182—107 3 Claims



A stabilizing safety attachment for ladders and having an elongate base channel extending across and beyond lower end of the legs of the ladder. The web material of the base channel is bent upwardly to provide lower attachment flanges for pivotal brace members extending upwardly and inwardly therefrom to attachment at the legs of the ladder by a threaded stud extending through a rung of the ladder. The device also has a pair of upturned retainer tabs formed from the web of the base channel for preventing

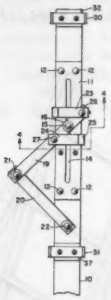
lateral movement of the legs of the ladder in the base channel.

3,618,704
FOLDING LEG BRACKET FOR SAWHORSE
James A. Smith, Sr., 128 N. Ruby Lane, Caseyville, Ill.
Filed Aug. 7, 1970, Ser. No. 61,978
Int. Cl. F16m *1/00*
U.S. Cl. 182—155 **9 Claims**



A folding leg bracket for sawhorses in which the bracket comprises a baseplate attached to the main rail of the sawhorse to provide a swivel surface directed at an angle to the axis of the rail for directing the folding action of the leg to and from a substantially parallel position alongside the rail, and a leg socket swivelly attached to the plate surface and movable between folded and angularly extended positions for determining the folded and angularly erect positions of the leg.

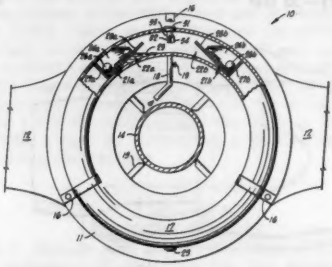
3,618,705
LADDER LEVELER
Earl Waldren, 3827 Park Ave., Covington, Ky.
Filed Sept. 23, 1970, Ser. No. 74,686
Int. Cl. E06c *7/44*
U.S. Cl. 182—204 **1 Claim**



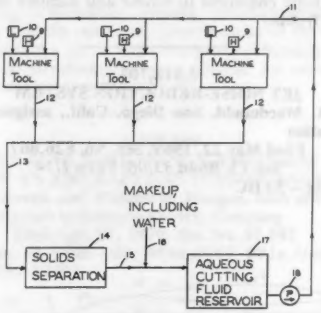
A ladder leveling device to be secured to a side rail of a ladder having a pair of adjustable arms and a self-adjustable, automatic locking device, attachable to either rail of any standard extension or regular ladder.

3,618,706
AUTOMATIC LUBRICANT DISPENSING APPARATUS
Bob J. Wall, 1804 South High, Oklahoma City, Okla.
Filed May 13, 1970, Ser. No. 36,940
Int. Cl. F16n *1/00*; B26d *7/08*
U.S. Cl. 184—1 R **13 Claims**

Apparatus for dispensing limited quantities of fluids, such as fluid lubricants, at predetermined times, and specifically relates to apparatus for dispensing lubricant to the dies on a pipe threading tool. A preferred embodiment of the apparatus includes a torus-shaped reservoir in which a quantity of cutting oil is placed. On the radially inward surface of the reservoir may be provided a fluid outlet which communicates with a dispensing tube mounted on the reservoir, the outlet end of the tube being positioned immediately adjacent a cutting die. Inside the reservoir, trap means are provided for moving a portion of the lubricant in an upward direction during rotation of the reservoir for discharge through the dispensing tube.



3,618,707
METHOD OF LUBRICATING MACHINE TOOLS
Clyde A. Sluhan, Perrysburg, Ohio, assignor to Metal Chemicals Incorporated, Perrysburg, Ohio
Filed June 16, 1970, Ser. No. 46,743
Int. Cl. F01m *9/02*
U.S. Cl. 184—1 E **4 Claims**

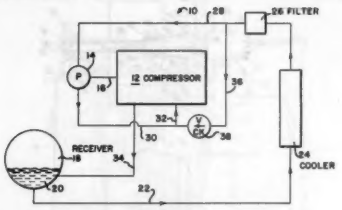


In the operation of at least one machine tool having at least one cutting tool, at least one spindle and at least one slide, a fluid lubricant is fed to the spindle and to the slide. This fluid lubricant is a water-emulsifiable composition consisting essentially of a mineral oil together with an emulsifying agent capable of causing the mineral oil to form a stable emulsion with water. At the same time, there is fed to the cutting tool an aqueous emulsion consisting essentially of water, a mineral oil and an emulsifying agent that maintains the emulsion stable. The overflow or leakage of the fluid lubricant is mingled with the overflow of the aqueous emulsion, and the commingled fluids are collected. Then solids are removed from the commingled fluids to regenerate a clean aqueous emulsion, and the composition of the regenerated aqueous emulsion is adjusted by adding ingredients thereto, to bring the regenerated aqueous emulsion to substantially the same composition as the aqueous emulsion initially fed to the cutting tool, and the regenerated aqueous emulsion is recirculated to the cutting tool.

3,618,708
COMPRESSOR COOLING AND LUBRICATING SYSTEM

Darrel D. Deines, Mocksville, N.C., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,857
Int. Cl. F16n *29/02*
U.S. Cl. 184—6.4 4 Claims

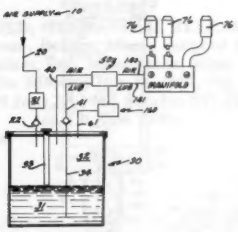


A lubrication system including a pump, compressor-driven, and thus subject to compressor speed excursions provided for supplying lubricant to the compressor, and a pressurized lubricant reservoir (which is pressurized by the compressor) also supplied for providing supplementary lubricant to the compressor. With high-speed operation of the compressor, the pump supplies the full lubricant requirement. With the compressor speed reduced, the pump accordingly delivers less than the full quantity of lubricant required by the compressor. It is at this time that the reservoir of lubricant, pressure-responsively, by way of a check-valved shunt line, automatically supplies the supplementary or makeup quantity of lubricant for the compressor.

3,618,709
PRESSURIZED LUBRICATION SYSTEM

Wallace G. Boelkins, Grand Rapids, Mich., assignor to Uni-Mist, Inc., Grand Rapids, Mich.

Filed Nov. 6, 1969, Ser. No. 874,508
Int. Cl. F16n *7/30*
U.S. Cl. 184—6.4 11 Claims

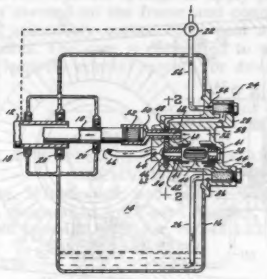


A pressurized lubrication system having a source of air under pressure coupled to a container which holds a quantity of lubricating liquid under a volume of pressurized air, with a metering valve and a check valve in the air line connecting the air source to the pressurized container, and with separate air and lubricant lines extending from the pressurized container to a manifold. The air and lubricant lines each contain a valve, both of which are controlled by a single solenoid, and the solenoid is in turn controlled by a pressure switch operatively connected with the pressurized container to activate the solenoid when the pressure in the container reaches a predetermined high level and to deactivate the solenoid when the pressure in the container reaches a lower predetermined level. The manifold at the end of the air and lubricant lines has metering valves for separately metering the rate of flow of air and lubricant through each of a plurality of coaxial tubes extending outwardly from the manifold, and each of said coaxial tubes have an applicating nozzle at the end thereof.

3,618,710
METERING AND SCAVENGE PUMP

Carroll W. DeLisse, and James I. Long, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Jan. 2, 1970, Ser. No. 162
Int. Cl. F16n *13/18;* F01m *1/02*
U.S. Cl. 184—6.11 6 Claims

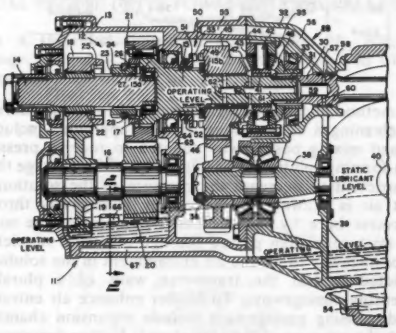


A metering and scavenge pump having scavenge pump means adapted to be driven by a first shaft of a dual-shafted gas turbine engine through speed-reducing means. The speed-reducing means is adapted to function as a pump to meter lubricant which has been pressurized by a supply pump, driven by the other shaft, into the sump cavity so as to establish a fixed relationship between lubricant flow into and out of the sump cavity and prevent undue accumulation of lubricant in the sump without oversizing the scavenge pump. An axial passageway is provided through the drive shaft of the speed-reducing means to direct scavenged lubricant internally of said first shaft.

3,618,711
LUBRICATION SYSTEM FOR A GEARED-DRIVE MECHANISM

George W. Vollmer, Chardon, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed June 8, 1970, Ser. No. 44,125
Int. Cl. F16n *7/36;* F01m *9/06*
U.S. Cl. 184—6.12 11 Claims

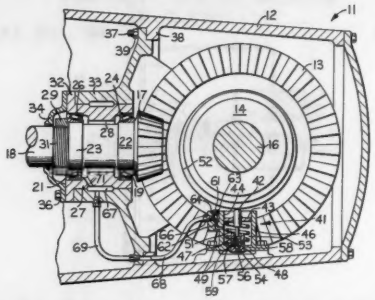


A positive lubrication system for an axle-mounted auxiliary transmission employed in conjunction with a truck axle. A conventional wiper system transfers lubricant from the axle to a power divider for a tandem axle or to a transfer case for a single axle, and a bearing located in the partition wall separating the power divider or transfer case and transmission units is utilized as a pump to deliver lubricant to the transmission. Lubricant pumped to the transmission is returned to a sump by means of core passages in the power divider/transfer case and transmission housing.

3,618,712
DIFFERENTIAL PINION BEARING LUBE PUMP

Robert Casey, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1970, Ser. No. 13,595
Int. Cl. F16n 7/36
U.S. Cl. 184—6.28 10 Claims

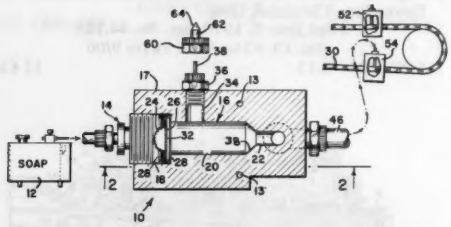


Lubricating and cooling oil is supplied to the pinion bearings of a differential by means of a pump located within the differential housing. The pump is of the plunger operated variety and is driven from the differential case to pump the oil contained within the differential housing to the bearings.

3,618,713
FOAM LUBRICATING SYSTEM AND METHOD

Robert L. Batchelor, 412 Beach Road, Venice, Fla.

Filed Dec. 12, 1969, Ser. No. 884,641
Int. Cl. F16n 15/00
U.S. Cl. 184—15 R 14 Claims



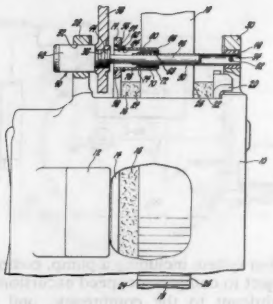
A method and apparatus is disclosed for foam lubricating and cleaning a chain conveyor. The apparatus includes an inclined mixing passageway adapted to receive pressurized foam-forming solution at one end thereof for passage through a restriction to decrease the pressure of the solution. Ambient air is drawn into the mixing passageway through a transverse bore by the decreased pressure of the solution. The mixture is then passed through a second restriction in the passageway to induce air entrainment in the solution and impacted against the transverse walls of a plurality of dispensing passageways. To further enhance air entrainment the dispensing passageways include expansion chambers in which the pressure of the admixture is further decreased. The finished foam is then delivered to various stations in contact with the conveyor chains.

3,618,714
DISC BRAKE FRICTION PAD ADJUSTING DEVICE

Harold E. Croswell, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 19, 1970, Ser. No. 38,685
Int. Cl. F16d 65/52
U.S. Cl. 188—71.8 4 Claims

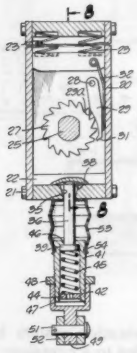
A spring steel clip is secured to an inner friction pad backing plate of a caliper disc brake assembly for movement along a modified caliper-supporting pin when the caliper piston is energized to apply the brake. The spring steel clip engages the outer surface of a bushing concentrically disposed upon the supporting pin in a one-way locking fashion whereby wear of the friction pads moves the spring clip along the outer surface of the bushing and positions the friction pad and backing plate assembly at a substantially constant clearance distance from the disc brake surface as the brake lining wears.



3,618,715
AUTOMATIC BRAKE-ADJUSTING DEVICE

James L. Bostwick, 1501 Bluff Drive, Santa Barbara, Calif.

Filed Sept. 25, 1969, Ser. No. 860,922
Int. Cl. F16d 65/56
U.S. Cl. 188—79.5 K 8 Claims



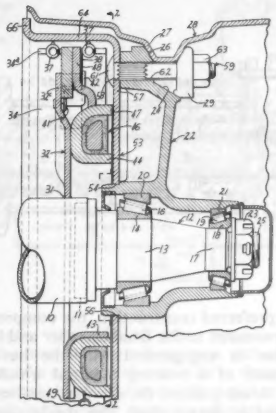
In combination with conventional brake power cylinder and brake-operating arm for a cam brake with a manual slack adjuster including a shaft rotatable to effect slack adjustment, a housing fixed to move with the brake-operating arm and into which the shaft projects and a ratchet wheel on the projecting shaft, a plunger or slide movable in the housing adjacent the wheel carries a pawl biased into contact with the wheel. A push rod guided into the housing moves the slide with respect to the wheel in response to motion of the brake-operating arm. Excessive arm movement, indicating brake action slack, causes the pawl on the slide to engage the ratchet wheel, turning the rotatable shaft to adjust the brake cam to reduce slack. Preferably, the push rod connects to the clevis of the air cylinder actuating rod, with override linkage between the actuating rod and the push rod.

3,618,716

ELECTRIC BRAKE, DRUM, HUB AND RIM ASSEMBLY

Donald T. Studdard, Winfield, and Thomas E. Morrison, Guin, both of Ala., assignors to Continental Conveyor and Equipment Company

Filed Jan. 14, 1970, Ser. No. 2,745
Int. Cl. F16d *65/34*; B60t *13/74*
U.S. Cl. 188—138 3 Claims



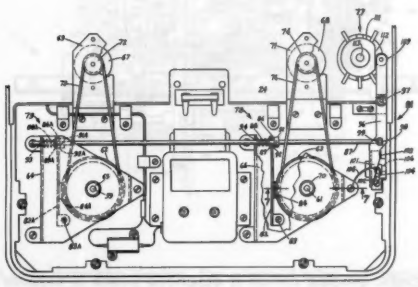
An electric brake, drum, hub and rim assembly in which the drum itself is formed of a single piece of steel plate so that the electric magnet portion of the brake mechanism contacts directly the head or inner plate of the drum. The outer or open end of the drum is provided with an integrally formed peripheral flange, thus to restrain the drum against bell-mouthing when the brakeshoe expands against the cylindrical part of the drum. Further, the drum is secured to the hub by headed bolts, the heads being on the inner surface of the drum head, and the bolts being long enough also to secure the hub to the tire rim, whereby the braking torque is transmitted directly from the drum to the rim of the tire.

3,618,717

SPRING APPLIED, MECHANICAL RELEASED BRAKE

Kermit V. Anderson, Delano, Minn., assignor to Washington Scientific Industires, Inc., Minnetonka, Minn.

Division of Ser. No. 653,435, July 14, 1967, Pat. No. 3,479,116.
Filed June 27, 1969, Ser. No. 837,211
Int. Cl. B60t *13/04*
U.S. Cl. 188—166 11 Claims



A portable film reader having a light source directing light through a lens system and film onto a mirror used to reflect the light onto a rear projection screen. The reader is mounted on a frame located in the bottom of a carrying case. Parallel linkage connect the mirror with the cover of the carrying case so that the mirror moves up and down with the cover. The screen pivotally attached to the frame has folding side shields which cooperate with the cover to enclose the space between the mirror and screen eliminating outside light on the rear of the screen. The cover projects forward from the screen to function as a light visor. In the storage position the screen and side shields fold down adjacent the frame and the mirror moves down into the case with the closing of the cover.

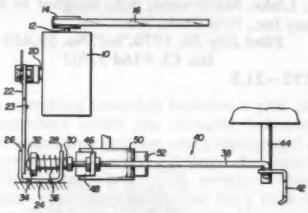
Spring applied cam release brakes are used to simultaneously brake the spindles carrying the film reels. A common control rod carries separate springs to apply pivoted brake levers. A lever pivoted on the frame and connected to the control rod is selectively moved by a cam and finger to release the brakes. The cam is connected to a dual switch operable to selectively control motors for driving the spindles.

3,618,718

BRAKE ACTUATED RETURN TO NEUTRAL MECHANISM

Andrew Blaauw, Winneconne, and Paul H. Stibbe, Neenah, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed June 10, 1970, Ser. No. 45,142
Int. Cl. F16h *45/02*
U.S. Cl. 192—4 B 9 Claims



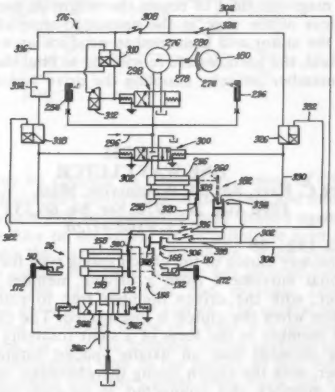
A hydrostatic transmission control linkage having a shift lever movable towards a drive position and a neutral position and to which is attached a friction plate adapted to normally retain the lever in the drive position by means of frictional contact with a plunger yieldably urged against the plate. The plunger is attached to one end of an actuating linkage, the other end of which is secured to a brake pedal in such a manner that, by depressing the brake pedal, the frictional contact between the friction plate and the plunger will be broken to automatically cause movement of the shift lever into the neutral position.

3,618,719

DUAL ENGINE DRIVE FOR MARINE PROPELLER SHAFT

Joseph A. Marland, Hinsdale, and Charles W. Hill, La Grange, both of Ill., assignors to Marland One-Way Clutch Corporation, La Grange, Ill.

Filed Jan. 23, 1970, Ser. No. 5,216
Int. Cl. F16h *57/10*
U.S. Cl. 192—4 R 4 Claims



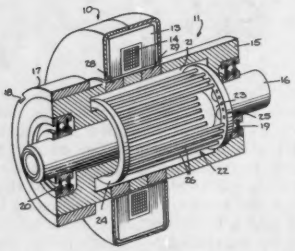
A marine propulsion transmission for driving a propeller in a forward direction by a main engine and an auxiliary engine

working either individually or in unison and for driving the propeller in reverse by the main engine without reversing the auxiliary engine. The propeller is driven forwardly by the main engine through a one-way clutch allowing overdriving of the propeller by the auxiliary engine and integrated in parallel with a cushioned positive clutch through which the main engine drives the propeller in reverse. The propeller is also driven forwardly by the auxiliary engine through a one-way clutch allowing overdriving of the propeller by the main engine and integrated in tandem with a positive clutch. Integrated electrical and hydraulic controls provide for alternate engagement of the positive clutches to assure disengagement of the auxiliary engine when the propeller is driven in reverse. A brake operated automatically by the same controls briefly stops a freewheeling drive element between the tandem clutches before the corresponding positive clutch is engaged. Working parts are lubricated by jets of fluid under pressure from the hydraulic control system directed into the ends of mutually concentric components.

3,618,720
MAGNETIC-PARTICLE CLUTCH OR BRAKE

Ernest A. Linke, Maplewood, N.J., assignor to Bulova Watch Company Inc., New York, N.Y.

Filed July 30, 1970, Ser. No. 59,459
Int. Cl. F16d *37/02*
U.S. Cl. 192—21.5 **8 Claims**



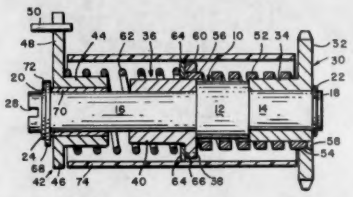
A magnetic-particle clutch constituted by a stator surrounding a rotor assembly having an input member and an output member which are intercoupled when the stator coil is excited. The input or drive member is a cylindrical body having an annular cavity for containing magnetic particles, the output or driven member being formed by a shaft coaxially disposed within the input member and rotatably supported therein, a cylindrical particle-trap rotor being mounted on said shaft and being positioned to rotate within the annular cavity. The particle-trap is formed by a circular cage of alternately polarized parallel bars which create an internal magnetic field to retain the magnetic particles in the interstices of the cage in the unexcited state of the clutch. When the stator coil is excited to produce an external magnetic field, the particles are reoriented to bind the cage to the input member, thereby coupling the drive and driven members.

3,618,721
ONE-WAY CLUTCH

Richard C. Hare, Box 33, Whitinsville, Mass.

Filed Aug. 24, 1970, Ser. No. 66,332
Int. Cl. F16d *41/20*
U.S. Cl. 192—35 **6 Claims**

A one-way clutch of the clutch spring type for transmitting rotational movement from a driving member to a driven member, with the driven member free to rotate in either direction when the clutch is disengaged. The clutch has the driven member in the form of a shaft rotatably carrying the driving member and an axially spaced rotatable bushing member, with the clutch spring therebetween, encircling the driven member and connected at its ends to the driving member and bushing member. Axially spaced from the bushing member and also rotatably carried by the driven member shaft is a member fixed against rotation. A compression spring, e.g., a coil spring, encircles the driven member shaft between the fixed member and bushing member and urges them axially apart, the compression spring providing a torsional drag on the bushing member to cause the clutch spring to contract to engage the driven member when the driving member is rotated relative thereto. The compression spring further provides an axial force on the bushing member and fixed member to hold the clutch parts in spring loaded posi-

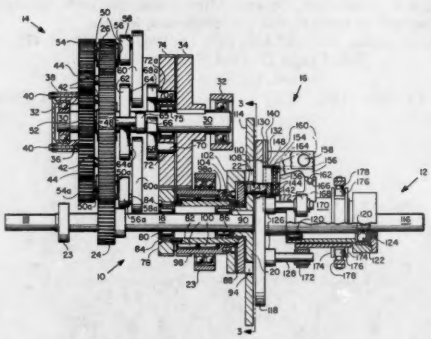


tion. In the preferred construction, the compression spring is functionally secured to the fixed member and bears against a thrust washer in engagement with the bushing member, which is made of a bearing material which freely slides against the thrust washer; the driving member has a hub of diameter slightly larger than the inside diameter of the relaxed clutch spring; and the driven member has a hub with a diameter slightly less than the relaxed clutch spring inside diameter.

3,618,722
CYCLIC CLUTCH

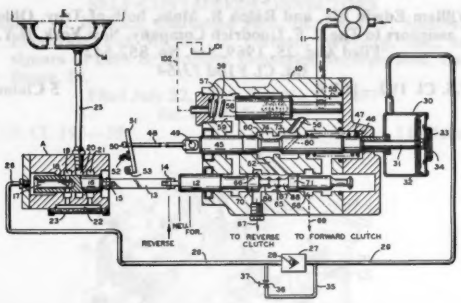
Paul W. Eschenbach, Inman, S.C., and Howard N. Watrous, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 27, 1970, Ser. No. 58,481
Int. Cl. F16d *23/10*; **F16h** *35/02*
U.S. Cl. 192—48.9 **29 Claims**



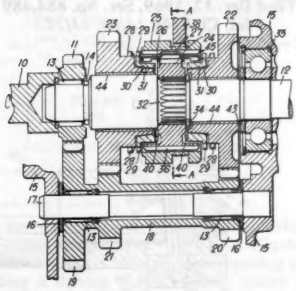
A cyclic phasing clutch is described which is capable of losing one or more integral revolutions of the load while the input shaft rotates at constant speed. Two acceleration-deceleration generators, the output angular velocities of which vary cyclically, are employed with the outputs thereof out of phase with one another by approximately 360° of clutch input shaft rotation. A device is provided for selectively engaging the clutch output shaft with the clutch input shaft, with the output shaft of either acceleration-deceleration generator or, if desired, with a stationary locking means. The preferred type of acceleration-deceleration generator is a drag link using an elliptical input constraint.

3,618,723
TRANSMISSION CLUTCH CONTROL
John C. McPherson, Philadelphia, Pa., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 18, 1969, Ser. No. 877,744
Int. Cl. F16d 25/10; F15b 11/12, 13/044
U.S. Cl. 192—51 31 Claims



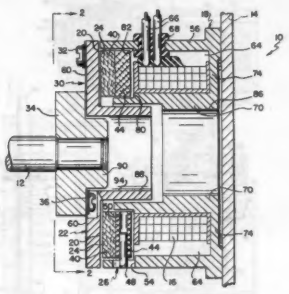
In a hydraulic transmission, the movement of the directional valve into its neutral position automatically effects movement of a control valve to relieve the transmission forward and reverse clutches of hydraulic pressure. When the directional valve is thereafter moved to forward or reverse, hydraulic pressure is applied to one of the clutches but at a controlled rate through automatic metered movement of the control valve. The control valve may also be moved manually so as to contribute inching.

3,618,724
SYNCHRONIZER DEVICES FOR STEPPED-RATIO CHANGE-SPEED GEARS FOR MOTOR VEHICLES
Adolf Oehl, Am Eulenrech, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 5, 1970, Ser. No. 650
Claims priority, application Germany, Jan. 7, 1969, G 69 00 376
Int. Cl. F16d 23/02
U.S. Cl. 192—53 F 3 Claims



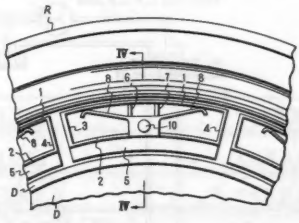
A synchronizer device for stepped-ratio change-speed gears of a motor vehicle utilizes blocker rings (baulk rings) for delaying positive-clutch engagement of a slidable coupling sleeve until a pair of rotary transmission parts to be coupled together approach synchronism. To prevent small axial movements of the blocker rings which should give rise to noise in certain circumstances, an annular spring between each blocker ring and a first rotary transmission has a free end which is shaped to exert an axially outward bias on the respective blocker ring such that the blocker ring is thereby maintained in continuous clearance-free contact with a second rotary transmission part.

3,618,725
TORQUE-TRANSMITTING ASSEMBLY
Walter J. Penkal, Jr., Parma Heights, and Kirit R. Patel, Cleveland, both of Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 12, 1969, Ser. No. 875,871
Int. Cl. F16d 3/14, 27/06
U.S. Cl. 192—55 12 Claims



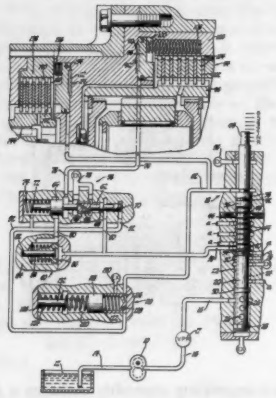
A torque-transmitting assembly includes a pair of torque-transmitting members which are movable between an engaged torque-transmitting position and a disengaged position. Upon energization of an electrical coil, the members are moved into the torque-transmitting position. One of the torque-transmitting members is carried by a base and supported thereon for limited rotational movement relative thereto. During the relatively low pressure initial engagement between the torque-transmitting members, the one member rotates relative to the base to minimize slippage between the torque-transmitting members.

3,618,726
FRICTION BRAKE OR CLUTCH ARRANGEMENT
Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 22, 1970, Ser. No. 30,873
Claims priority, application Japan, Dec. 29, 1969, 45/418
Int. Cl. F16d 11/06, 25/04
U.S. Cl. 192—79 6 Claims



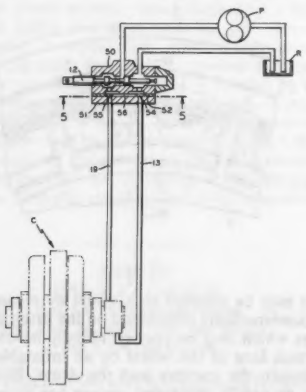
A drum may be coupled to a wheel by means of friction shoes circumferentially distributed on the drum and mounted on carriers which may be pressed radially inward against an outer friction face of the wheel by an inflatable tube interposed between the carriers and the drum. Each carrier is guided by an axially elongated, square bar secured between two radial flanges of the drum and movably confined between radial guide walls of the carrier. The central portion of a plate spring having the shape of a wide V is mounted on each end of the bar, and the terminal spring portions engage an inner circumferential wall of the carrier to bias the friction shoe associated with the carrier away from the wheel. The springs prevent slipping engagement between the shoes and the friction face of the wheel when pressure fluid is released from the inflatable tube.

3,618,727
OVERLAP VALVE
John P. Cornet, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 16, 1970, Ser. No. 11,704
Int. Cl. F16d 25/10
U.S. Cl. 192—87.13 2 Claims



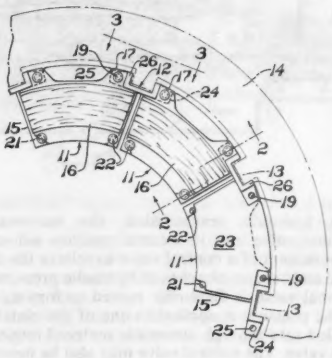
A transmission control system for controlling the engagement and disengagement of a pair of friction drive establishing devices. The control has an overlap control valve having differential area lands and differential area ends for maintaining pressure in the friction device to be disengaged until sufficient pressure is present in the friction device to be engaged to permit torque reaction of the engaging device to maintain continuity of drive during the shift period.

3,618,728
REVERSING CLUTCHES WITH FLUID FLOW CONTROLS
John C. McPherson, Philadelphia, Pa., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 17, 1969, Ser. No. 877,117
Int. Cl. F16d 25/10
U.S. Cl. 192—87.19 3 Claims



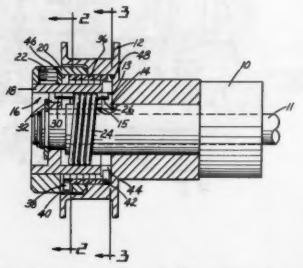
In a hydraulic transmission, a dampener such as an accumulator is placed in the passages transmitting hydraulic fluid pressure to the transmission clutches in order to prevent the sudden engagement of the clutches. In a modification, the dampener is a bypass between the passages transmitting fluid pressure to the clutches, so that the dissipation of fluid pressure through the bypass prevents sudden engagement of the clutches. In a further modification the bypass is formed in a gasket for a valve body in which there are openings for each of the passages in the valves body conveying fluid pressure to the clutches. The cutting away of a part of the gasket actually forms the bypass.

3,618,729
SEGMENTED FRICTION MEMBER FOR BRAKE OR CLUTCH
William Edwin Ely, and Ralph R. Main, both of Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,542
Int. Cl. F16d 13/64
U.S. Cl. 192—107 R 5 Claims



A brake or clutch mechanism that has an annular stator or rotor composed of a plurality of connected individual segments. Each segment has a plate member of heat-absorbing material sandwiched between facing members which are connected by torque links to facing members of adjacent braking segments. The torque links additionally provide splined engagement with an associated part of the brake or clutch for transmitting torque to and from the braking segments.

3,618,730
TORQUE-LIMITING CLUTCH
Herbert Mould, III, Bloomfield, N.J., assignor to Vari-Typer Corporation, Hanover, N.J.
Filed Dec. 12, 1969, Ser. No. 884,489
Int. Cl. F16d 13/08, 43/21
U.S. Cl. 192—56 C 8 Claims



A torque-limiting device is provided which has a rotatably mounted driving member and a driven member. The driving member is connected to a spring cage member through a torsion spring. A clutch spring is disposed to provide frictional driving engagement between the cage member and the driven member. The clutch spring and the driving member are provided with coacting surfaces to release the driving engagement between the cage member and the driven member when a given angular displacement between the cage member and the driving member occurs. The angular dis-

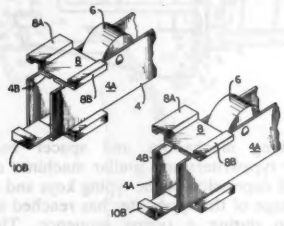
placement between the driving member and the cage member will be proportional to the torque applied by virtue of the torsion spring connection between the driving member and the cage member.

3,618,731

MATERIAL-HANDLING ASSEMBLY OF UNITS HAVING SELF-CONTAINED CONNECTORS

Ralph W. Jindrich, Clarendon Hills, Ill.; Alan W. Speicher, Evansville, and Michael G. Forman, Newburg, Ind., assignors to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.

Filed July 22, 1969, Ser. No. 843,407
Int. Cl. B65g *13/00*
U.S. Cl. 193—35 11 Claims



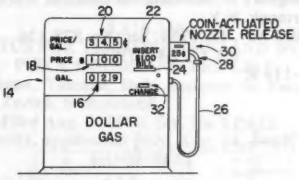
Conveyor units each comprising a pair of rails having a plurality of rollers journaled therein. Each unit has a plurality of transverse brackets on the upper and lower margins thereof, the brackets having U-shaped ends for assembling units in a side-by-side relationship. U-shaped brackets are also on the ends of each unit for end-to-end assembly and locking. The units are adapted to be assembled in an alternately inverted arrangement to serve as a dolly.

3,618,732

GASOLINE-DISPENSING SYSTEM

Harry D. Forse, 220 Woods Road, Edgewood Addition, Anderson, Ind.

Filed Jan. 13, 1970, Ser. No. 2,563
Int. Cl. G07f *1/06*
U.S. Cl. 194—4 19 Claims



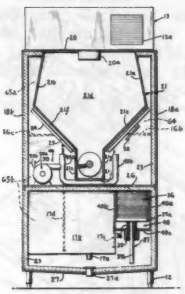
A system for dispensing a quantity of gasoline having a selling price equal to a predetermined denomination of paper currency, such as a one dollar bill. A computing pump is provided including a driving motor, a flow meter which measures the volume of gasoline delivered by the pump, and a selling price computer operated by the flowmeter. A bill reader is provided which receives and inspects the bill to determine its validity and denomination and provides an output signal when the bill has been determined to be valid and of the correct denomination. The motor is started to initiate the pumping operation in response to the output signal from the bill reader and the motor is stopped to terminate the pumping operation by the selling price computer when the selling price of the gasoline dispensed equals the denomination of the bill. A coin-actuated device is provided into which a coin, such as a quarter, must be deposited before the dispensing nozzle can be removed from the holder. Upon properly returning the nozzle to the holder, the coin is returned. Operation of the system is inhibited until the nozzle has been properly positioned and locked into the fill pipe.

3,618,733

ICE CUBE DISPENSER WITH HOPPER SHAPED AND HEATED TO INHIBIT BRIDGING

Marion H. Winsett, c/o N. F. Abramowitz, 2020 Richmond, Houston, Tex.

Filed Apr. 15, 1970, Ser. No. 28,579
Int. Cl. G07f *11/00*
U.S. Cl. 194—10 10 Claims



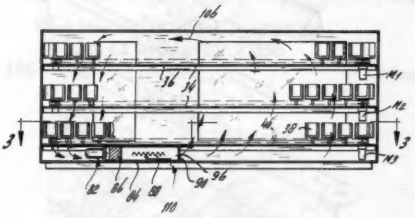
The invention discloses an ice cube vending machine which supports an ice cube making machine thereon which discharges the ice cubes it manufactures downwardly into a hopper tapered first to spread the cubes to minimize abutting cubes bridging or freezing together, the hopper then being oppositely tapered to deliver the cubes centrally into a helix conveyor chamber therebelow from which they may be delivered by metered delivery to drop downwardly into a front opening chamber into which a receptacle has been inserted to receive them. The lower part of the hopper is provided with heated radiator fins which radiate heat through to the ice cubes thereabove, further to inhibit the tendency of the converging ice cubes to freeze or "bridge" together.

3,618,734

SPECIMEN INCUBATOR

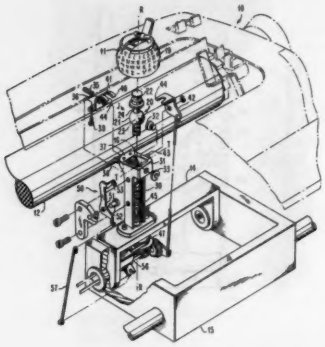
Waheed N. Khan, Silver Spring, Md., assignor to Research Foundation of Children's Hospital of the District of Columbia, Washington, D.C.

Filed June 10, 1969, Ser. No. 831,957
Int. Cl. C12b *1/00*
U.S. Cl. 195—139 3 Claims



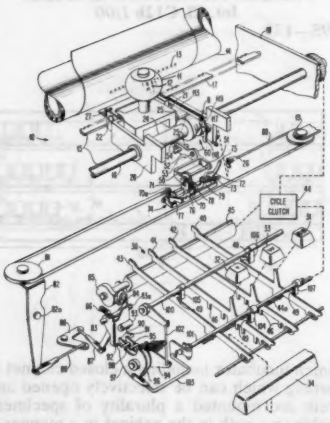
A specimen incubator including a closed cabinet having an access opening which can be selectively opened and closed, and wherein are mounted a plurality of specimen support trays movable in a path in the cabinet in a manner for selective placement of any given tray at the access opening, and further including means for controllably circulating a gaseous medium in the cabinet with means provided to preclude entrance of external atmosphere into the incubator under open conditions thereof, the incubator preferably including pluralities of specimen support trays in vertically separate tiers, and movement of the trays in the individual tiers being individually separately controllable.

3,618,735
SPHERICAL TYPE ELEMENT SUPPORT
Charles D. Bleau, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,421
Int. Cl. B41j *1/60*
U.S. Cl. 197—16 11 Claims



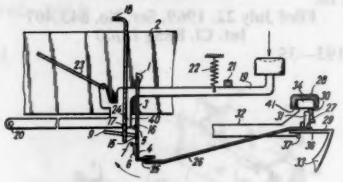
A simplified articulated joint for a spherical-type element is provided by a ball retained in a specially oriented, restricted surface bearing member such that impact and detent forces are directly absorbed by the bearing member.

3,618,736
VARIABLE FORCE IMPACT PRINTER WITH BACKSPACE MECHANISM
William A. Abell, Jr.; Charles M. Isaacs, and Jerome B. O'Daniel, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1969, Ser. No. 887,027
Int. Cl. B41j *23/08, 19/62*
U.S. Cl. 197—17 10 Claims



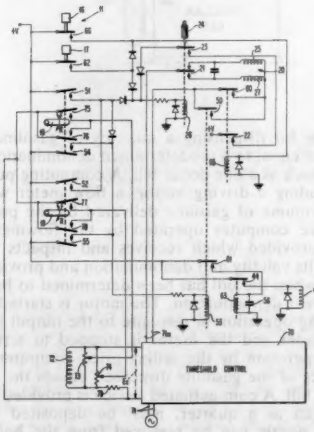
A single-elment printer having a complex drive cam for control of print impact velocity, employs power taken from the print shaft within the type element carrier to perform backspace operations as selected by the velocity control mechanism.

3,618,737
SPACER BAR AND KEY LOCKING MECHANISM FOR TYPEWRITERS AND SIMILAR MACHINES
Miroslav Blaha; Rostislav Slama; Jan Sobotka, and Frantisek Hemzal, all of Brno, Czechoslovakia, assignors to Zbrojovka Brno, narodini podnik, Brno, Czechoslovakia
Filed Dec. 16, 1968, Ser. No. 783,900
Claims priority, application Czechoslovakia, Dec. 15, 1967, 8865/67
Int. Cl. B41j *5/22, 29/56*
U.S. Cl. 197—107 5 Claims



A key locking mechanism and spacer bar locking mechanism for typewriters and similar machines adapted to prevent the full depression of the typing keys and spacer bar when the carriage of the typewriter has reached a predetermined position during a typing sequence. The locking mechanism comprises a locking bar having a main stop surface and an auxiliary stop surface which is mounted slightly below the main stop surface and which is positioned in front of the main stop surface in the direction to the pivoting movement of the locking bar. A two-armed disconnecting lever is pivotally supported on the typewriter frame. One arm of the two-armed lever is connected by means of a rod to the locking bar. The other arm of the locking lever extends into the path of movement of the typewriter carriage. When the latter has reached a predetermined point in its travel it causes a pivoting of the two-armed lever thereby causing the locking bar and locking stop post to move into their locking positions and thereby prevent the depression of the typewriter keys or spacer bar.

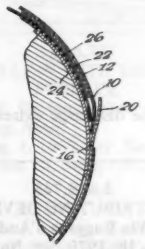
3,618,738
VERTICAL PAPER FEED FOR A DRAFTING TYPEWRITER
Richard G. Boyatt, and George T. Williams, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 19, 1969, Ser. No. 878,126
Int. Cl. B41j *19/76*
U.S. Cl. 197—114 R 11 Claims



A drafting typewriter is provided for typing notes and dimensions on large sheet material. An improved paper feed

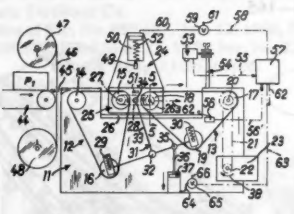
provides for selective slow, fast, forward, or reverse running movement of the paper to locate an area where typing is desired. This movement is effected through the use of an electric motor that is at all times connected to the paper feed mechanism. The same motor is employed to provide incremental forward and reverse stepping motion of the paper feed mechanism to define adjacent printing lines through the use of a displacement measuring transducer.

3,618,739
WRITING MATERIALS HOLDER
Lester K. Fleischmann, 1620 Ravine Terrace, Highland Park, Ill.
Filed Aug. 20, 1969, Ser. No. 851,616
Int. Cl. B41j *13/12*
U.S. Cl. 197—136 **5 Claims**



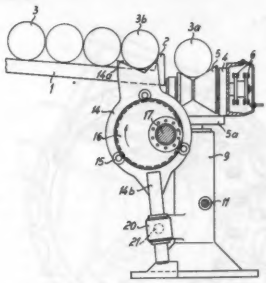
A writing materials holder for use in a typewriter having a relatively hard platen, to hold writing materials which have stencil portions, such as foil, which are permanently deformed or embossed with the impression of the type when struck thereby. The holder is laminated to form a pocket between a pair of layers and within which is received a thin, flexible and resilient cushioning sheet which facilitates deforming the foil when typed. A lip is formed along the pocket for receiving and holding writing materials in juxtaposition over the cushioning sheet for movement about the platen with the holder. In the preferred form of the invention, the holder comprises a cylindrical member positionable about the platen of the writing machine and of a diameter greater than the diameter of the platen so as to loop outwardly about the platen. The sides of the pocket at the edge of the cylindrical member are open to permit replacement of the cushioning sheet.

3,618,740
APPARATUS FOR TRANSPORTING AND WORKING PIECE GOODS AND THE LIKE
Franco Taverna, Valenza, Italy, assignor to Ferag, Fehr & Reist AG, Zurich, Switzerland
Filed Aug. 6, 1970, Ser. No. 61,622
Claims priority, application Italy, Aug. 26, 1969, 106 A/69
Int. Cl. B65b
U.S. Cl. 198—19 **8 Claims**



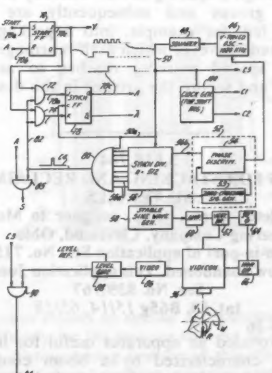
An apparatus for transporting and working piece goods comprising a driven endless conveyor mechanism and a work station displaceable substantially parallel to the feed direction of said conveying mechanism. The conveying mechanism provides at the region of the work station an infeed section and an outfeed section. Deflecting roller means rotatable by the conveying mechanism serve to rotatably mount the infeed section and the outfeed section. A brake mechanism prevents rotation of at least a deflecting roller means associated with the outfeed section relative to the work station during the time that a working operation is carried out upon one of the piece goods. There also being provided a return mechanism for the work station actuated in opposite phase relationship to said brake mechanism that is when the latter is rendered inoperable, for returning the work station back into its starting position.

3,618,741
APPARATUS FOR MANIPULATING HEAVY WORKPIECES
Siegfried Berndt, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany
Filed Nov. 14, 1969, Ser. No. 876,821
Claims priority, application Germany, Nov. 15, 1968, P 18 09 152.6
Int. Cl. B65g *47/04*
U.S. Cl. 198—26 **9 Claims**



The foremost workpiece of a series of elongated heavy workpieces resting on an inclined support is transferred onto a conveyor by a transfer unit which comprises a series of straps surrounding eccentrics and having sockets at their upper ends and elongated extension at their lower ends. The extension slide in tubular holders mounted to pivot about an axis which is parallel to the drive shaft for the eccentrics whereby the sockets lift the foremost workpiece and transport it along an arcuate path toward and onto the conveyor while the extensions pivot with and slide relative to their holders in response to rotation of the eccentrics.

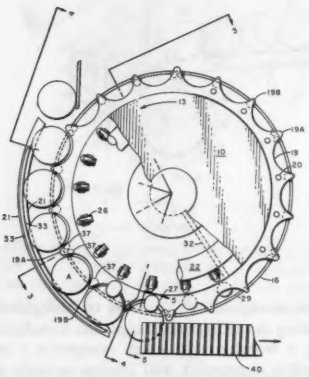
3,618,742
AUTOMATIC OBJECT ADJUSTMENT
Stanley J. Blanchard, 4 Washington Square Village, New York, N.Y.; George C. Devol, 990 Ridgefield Road, Wilton, Conn., and Paul S. Martin, 189-54 43rd Road, Flushing, N.Y.
Filed May 18, 1970, Ser. No. 38,020
Int. Cl. B65g *47/24, 43/00*
U.S. Cl. 198—33 AB **14 Claims**



An object in a desired position is subjected to a circular scan about a reference point and the result is stored as a pat-

tern of impulses representing the contrast between the object and the background. Articles that are later disposed at random angles about the same reference point are subjected to a circular scan, the result is compared with the stored pattern of impulses, and the result of the comparison is used for adjusting the later atricles to the desired orientation.

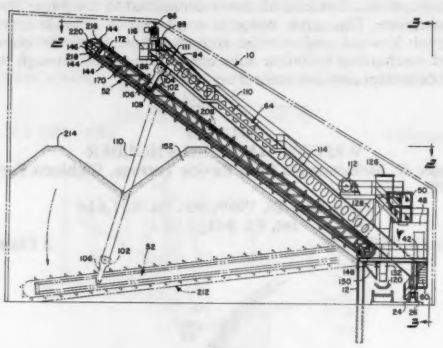
3,618,743
ARTICLE-ORIENTING DEVICE
Victor Benatar, Atlanta, and John H. Perry, Doraville, both of Ga., assignors to The Mead Corporation
Filed Nov. 5, 1969, Ser. No. 874,326
Int. Cl. B65g *29/00, 47/24*
U.S. Cl. 198—33 **17 Claims**



Where consumer-type primary packages such as cans and bottles are arranged and packaged in groups, it is desirable in many instances to orient the individual primary packages so that their labels face outwardly. A device for this purpose is disclosed wherein relatively movable spinning elements are arranged to engage different parts of an article and are effective to rotate the article until a desired position is attained. Article-positioning means prevent the article from toppling over during spinning and hold the article against undesired bodily movement in a direction transverse to its axis of rotation. Article-gripping means respond to sensing means and grip each article at the desired orientation. The primary packages or articles are fed into the device on an infeed conveyor and through a spacing device whereby the articles are arranged in groups and subsequently are individually oriented and fed, for example, into a packaging machine along an outfeed conveyor which itself is arranged with a pair of vertically spaced working reaches so as to receive therebetween and secure the articles in the desired orientation.

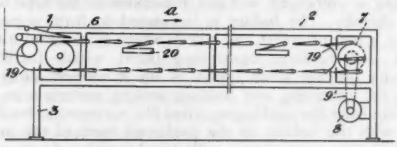
3,618,744
APPARATUS FOR STACKING AND RECLAIMING BULK MATERIALS
Roger L. Hulette, Berea, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio
Continuation-in-part of application Ser. No. 715,745, Mar. 25, 1968, now abandoned. This application June 11, 1969, Ser. No. 839,767
Int. Cl. B65g *15/14, 65/28*
U.S. Cl. 198—36 **10 Claims**

There is provided an apparatus useful for handling bulk material and characterized by a boom constructed and adapted both to reclaim and to stack bulk material. In specific embodiments of the invention, an endless conveyor belt coacts in the same boom with an endless chain of material-raking flights as it traverses the upper side of the boom to



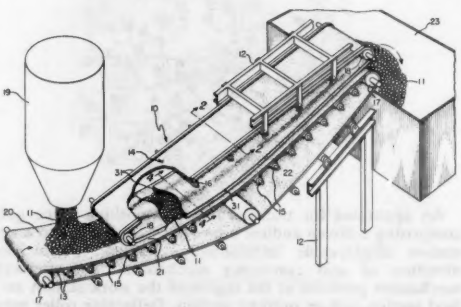
convey material to the discharge extremity of the conveyor belt.

3,618,745
DISTRIBUTING DEVICE
Antonio Dominici, 8, Via Ruggero d'Andreotto, Perugia, Italy
Filed Feb. 18, 1970, Ser. No. 12,379
Claims priority, application Italy, Feb. 18, 1969, 35064A/69
Int. Cl. B65g *15/00*
U.S. Cl. 198—155 **7 Claims**



A series of downward tiltable trays are connected end-to-end to form a conveyor traveling over the feeders leading to the machines to which the load traveling on the trays is to be distributed, while means are provided to tilt the trays toward the feeders in order to transfer their load upon them, while a movement equal and contrary to that of the trays is imparted to the tray surface during said transfer.

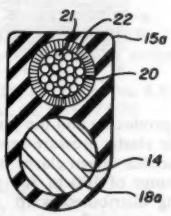
3,618,746
BELT ASSEMBLY
Paul D. Suloff, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 1, 1969, Ser. No. 862,831
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 **13 Claims**



A material-retaining belt of the type used as a cover belt disposed above and in confronting relationship to a material-

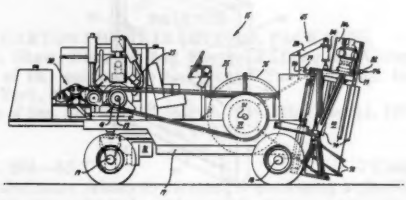
conveying base conveyor belt in a conveyor system in which the two belts cooperate to transport bulk material from one level to another without spillage or slippage thereof. The retaining belt has a generally rectangular cross section for at least a majority of its width and includes a first portion of elastomeric material containing weighting means, such as lead dust, therein and a second portion in substantially parallel relationship with the first portion which contacts the material being conveyed. The second portion has a center section containing longitudinally extending tension elements and at least substantially unreinforced lateral sections on either side of the center section to enable the retaining belt to drape over and firmly contain the material being conveyed. Particularly when lumpy material is being conveyed, the retaining belt also preferably includes edge portions additionally weighted and adapted to conform to the confronting surface of the edges of the conveying belt to effect a seal to contain the material.

3,618,747
CONVEYOR CHAIN LINK WITH YIELDABLE CONTACT SURFACE
Clifton E. Hammond, Gering, Nebr., assignor to Lockwood Corporation, Gering, Nebr.
Filed Aug. 1, 1969, Ser. No. 846,890
Int. Cl. B65g *15/52*
U.S. Cl. 198—195 **10 Claims**



A link member for chain conveyor assemblies having a U-shaped portion at each end for connection with a similar link of the chain, and a bridging member connecting the U-shaped end portions and extending through a bore of a yieldable body of oblong section in friction fit with the bordering surface of said bore. The body has a second bore which may be an opening through its lengthwise extent, or tapered and open at only one end, or at least partially filled with cellular rubber. SAid second bore provides increased yieldability in the body material adjoining the bore which has a cushioning effect in contacting produce being moved by the conveyor.

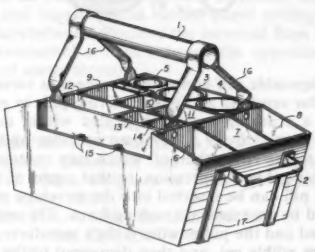
3,618,748
FEED AND GUIDANCE CONTROL APPARATUS FOR A TREE HOGGER UNIT
Routhford J. Burkett, Indio, Calif., assignor to Coachella Valley Organic Fertilizer Co.
Division of Ser. No. 699,687, Jan. 22, 1968, Pat. No. 3,545,692. Filed Mar. 11, 1970, Ser. No. 23,527
Int. Cl. B65g *33/06, 65/06*
U.S. Cl. 198—213 **2 Claims**



The following disclosure describes an improved feed and guidance control for feeding tree parts to a masticator assembly which comprises a part of a tree hogger unit.

The feed apparatus includes a pair of spaced-apart rotatable drums having a series of blades thereon adapted, when said drums are rotated, to engage, lift and move tree parts between the drums. An essentially smooth-walled chute is provided between the drums and masticator assembly, converging toward the latter, and adapted to guide tree parts smoothly to the assembly. A member is also provided which is adjustably positioned with respect to the drums to deflect branches and other tree parts extending thereabove, and confine them to the area swept by the rotating drums.

3,618,749
PLUMBERS TOOL CARRIER
Joseph R. Vaccaro, Flanders, N.J.
Filed Aug. 8, 1969, Ser. No. 848,468
Int. Cl. B65d *85/54*
U.S. Cl. 206—16 **4 Claims**



A tool carrier particularly adapted for plumber's tools comprising:

a. an elongated box having a bottom, two sides and two ends and being open on top,

b. the interior of the box being divided into compartments of a size and shape to hold plumber's tools

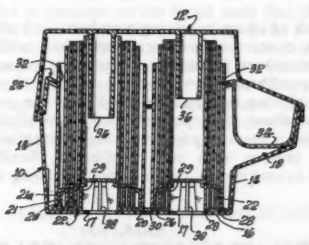
c. a carrying handle protruding from the top of the box

d. the ends of the box being angled outwardly from the bottom

e. a handle on each end of the box

f. strap members connecting the two end handles with the carrying handle and providing a reduced bottom surface for dragging the tool carrier and serving as support members for when it is carried.

3,618,750
STORAGE AND DISPENSING RECEPTACLES
Kenneth Reiner, 7875 Telegraph Road, Pico Rivera, Calif.
Filed Oct. 7, 1969, Ser. No. 864,484
Int. Cl. B65d *83/00, 85/20;* **A45d** *4/00*
U.S. Cl. 206—45 **8 Claims**



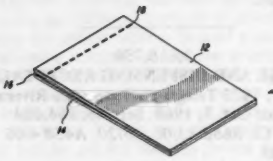
This invention relates to special receptacles of a type intended specifically for the storage and use of nested tubular articles. The distinguishing feature of this invention is that the receptacle, in closed position, contains nested tubular articles in a minimum of space, i.e. one within the other, and is

so constructed that in the open position the nested tubular articles may be raised varying heights so as to be selectively available to the user. Examples, as shown and described, are for the storage and presentation for use of hair rollers and of the type used by women in setting their hair.

3,618,751
CRUSHING AND DISPENSING CONTAINER FOR ADMINISTERING PILLS
Ernest J. Rich, Hunterdon County, N.J., assignor to Joseph Nichlos, Princeton, N.J.
Filed Jan. 15, 1970, Ser. No. 3,125
Int. Cl. B65d *1/36, 81/32, 85/56*
U.S. Cl. 206—47 R **8 Claims**

A disposable self-contained device in a variety of different forms for crushing and administering pills in powder form in which a crushing surface is sealed within an envelopelike pouch formed from a tray base member and a plastic film sealed to the edges thereof, which tray contains a spoon and an edible gel in a depression, so that a part of the film can be torn, a pill can be inserted into the envelope pouch and then crushed by an external crushing force. The rest of the film is removed and the pill powder is then transferred to and mixed with the edible gel, and then dispensed to the patient by the spoon which is shaped so as to mate with the depression containing the edible gel and powder, so the patient easily can swallow substantially all the pill powder.

3,618,752
STACK OF IMAGE-RECEIVING MEMBERS
Thomas B. Barker, Webster; Bruce D. MacLellan, Webster, and Casimir J. Mytych, Penfield, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 589,279, Dec. 1, 1966, Pat. No. 3,519,124. Filed May 22, 1969, Ser. No. 851,113
Int. Cl. B65h *55/00;* **B32b** *3/02*
U.S. Cl. 206—57 **1 Claim**

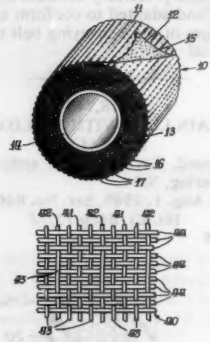


A stack of image-receiving members each of said members being in contact with adjacent members with each of said image members including a generally rectangular, transparent, nonfibrous, flexible sheet no more than about 6 mils thick, including materials selected from the group consisting of polysulfone and polyethylene terephthalate polyester resins and a sheet of paper backing substantially coextensive and in register with said nonfibrous, flexible sheet and secured to said sheet along a common leading edge.

3,618,753
LARGE FLAKE RECONSTITUTED MICA INSULATION
David W. Glasspoole, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Sept. 17, 1968, Ser. No. 760,356
Int. Cl. B32b *19/00, 19/02;* **B65d** *85/67*
U.S. Cl. 206—59 **9 Claims**

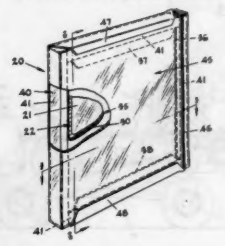
A reconstituted mica insulation sheet comprising large mica flakes has improved physical properties, particularly resistance to cut-through and sever mechanical abuse without danger of electrical failure. The sheet can be impregnated with resin, laminated to webs, adhesive-coated, slit, and coiled to form insulating tapes.

3,618,754
CONFORMABLE ELASTIC ADHESIVE TAPE
Raymond M. Hoey, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed Feb. 11, 1969, Ser. No. 798,300
Int. Cl. C09j *7/04*
U.S. Cl. 206—59 C **15 Claims**



A method for producing and the product thereof comprising a conformable elastic pressure-sensitive adhesive tape including a low modulus woven elastic backing weighing, when relaxed, in the range of 100 to 300 grams per square yard and incorporating distributed warp yarns with elastomeric cores in the ratio range of from 1 such warp yarn in three to one in 6 total warp yarns, which distributed warp yarns cause the major surfaces of the backing when relaxed to assume a nonplanar character including intermingled raised and depressed areas, and a layer of pressure-sensitive adhesive substantially conforming with and adherent to one of the major surfaces of the backing, major surfaces of the tape becoming more nearly planar upon being stretched, specific embodiments of the tape possessing breathability, transverse hand-tearability, high strength and ready unrollability with its backing and adhesive surfaces in contact.

3,618,755
UNITIZED PACKAGE FOR SHEET MATERIALS AND METHOD FOR PACKAGING SAME
James S. Kean, Sr.; Frederick L. Metzger, and Ralph C. Hansen, all of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio
Filed May 4, 1970, Ser. No. 34,359
Int. Cl. B65d *85/48*
U.S. Cl. 206—62 R **8 Claims**



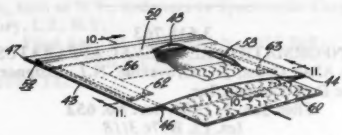
Improved manner for relatively low cost utilized packaging of glass sheets while ensuring the same against breakage and weathering during transportation or storage.

3,618,756

ARTICLE-HOLDING TABS FOR PEEL-OPEN PACKAGES

Robert J. Trewella, Reading, Pa., assignor to Wyomissing Corporation, Reading, Pa.

Filed Sept. 26, 1969, Ser. No. 861,362
Int. Cl. A616 *19/02*
U.S. Cl. 206—63.2 R 1 Claim



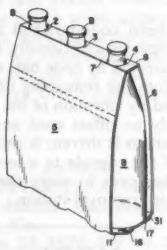
Article-holding tabs for peel-open packages to maintain the contained article in a desired location within the package. The article-holding tabs preferably comprise a pair of spaced parallel elongated strips of flexible material which are adhesively secured along one longitudinal edge to the package interior surface. The tabs facilitate the filling and sealing of the package and also position and hold the article during opening of the package to permit removal by a sterile technique.

3,618,757

ARTICLE CARRIER

James B. Funkhouser, Doraville, Ga., assignor to The Mead Corporation

Filed Jan. 29, 1970, Ser. No. 6,813
Int. Cl. B65d *75/06*
U.S. Cl. 206—65 E 4 Claims



An article carrier having top, bottom and sidewalls foldably joined together to form a tubular structure for disposition about a plurality of articles arranged in side-by-side rectilinear relation in at least one row includes at certain corners of the carrier a pair of divergent fold lines arranged to form a web panel which effectively aids in retaining the articles in the wrapper against dislodgment through the open ends thereof. Where apertures are formed at the carrier corners for receiving portions of the packaged articles to aid in retaining the articles, the web panel formed by divergent fold lines also inhibits tearing of a blank and thus further enchances package security.

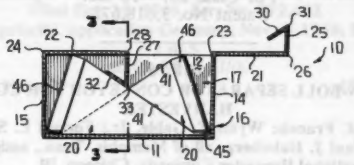
3,618,758

CARTON FOR TETRAHEDRAL PACKAGES

Fred B. Shaw, Hinsdale, and Florren E. Long, La Grange, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 804,633, Mar. 5, 1969. Filed Dec. 11, 1970, Ser. No. 97,174
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 T 2 Claims

This disclosure relates to cartons for packaging a plurality of individual tetrahedral articles and includes a carton body defined by a polygonally shaped bottom wall, opposite pairs of sidewalls, and opposite pairs of end walls, a closure panel is joined by a fold line to each sidewall with the closure panels being in a common plane parallel to the bottom wall in the closed position thereof, a medial panel is joined to each closure panel by a fold line with the medial panels being in side-by-side contiguous relationship generally parallel to a plane normal to the bottom wall, a terminal flap being joined to each medial panel along a fold line and being folded



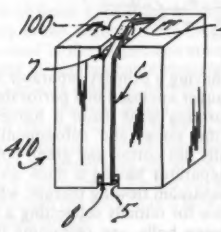
therealong into an outward and upward direction, and each terminal flap and its associated medial panel setting off an acute angle therebetween whereby the terminal flaps engage sides of the tetrahedral articles between the opposite transversely disposed seams thereof.

3,618,759

COMPRESSED SALT BLOCK AND METHOD

Richard Kolasinski, Richmond, and William S. Lewis, St. Clair, both of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Feb. 4, 1969, Ser. No. 796,362
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 B 1 Claim



A compressed sodium chloride salt block suitable for use as a salt source for animals, for brine-making in water-conditioning units, or for like uses requiring such salt blocks, wherein said block is comprised of a structure which includes one or more recessed surfaces or recess means on the surface of said block primarily operative to leave a free space between the body of said block and the surface on which it is to be supported so that the band or strap may be freely removed, and secondarily operative to retain the band or strap or the like in position on the block such that the compressed salt block can be readily grasped by hand for lifting and handling of the block, with the band or strap including releasable means as a part thereof such that the band or strap can be removed from the salt block if desired upon termination of the lifting or handling of the block; and, the method of preparing said salt block as well as the method of handling and using said salt block.

3,618,760

STORAGE STABLE ONE-PART POLYMERCAPTAN COMPOSITIONS

Douglas H. Strong, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 7, 1968, Ser. No. 765,626
Int. Cl. C08g *43/00*; B65d *81/00*
U.S. Cl. 206—84 3 Claims

This invention presents metallic soaps which are useful for promoting tack-free surfaces and for curing polymercaptan sealants with quick formation of a protective skin on the

polymercaptan sealant. Metallic soaps in combination with calcium peroxide are useful for promoting tack-free surfaces and for curing polymercaptan sealants with quick formation of a protective skin on the polymercaptan sealant.

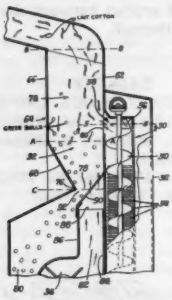
ERRATUM

For Class 207—80 see:
Patent No. 3,618,672

3,618,761
CLEAN-BOLL SEPARATOR CONVEYOR FOR COTTON HARVESTER

James M. Francis; Wyatt T. Gable, Jr.; Forrest L. Simpson, and Paul J. Hulseberg, all of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 741,722, May 19, 1970, Pat. No. 3,512,342. Filed June 30, 1969, Ser. No. 870,151
Int. Cl. B07b *9/00*
U.S. Cl. 209—37 **8 Claims**

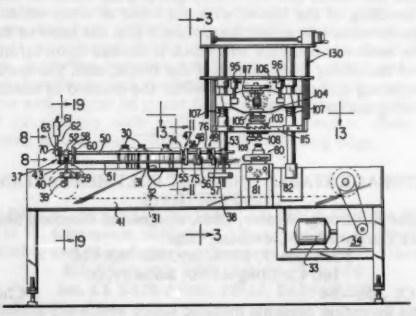


Cotton stripper having a primary separator which utilizes a generally vertical auger enclosed in a perforate housing being operative for separating trash from a harvested aggregate while advancing the same, and subsequently impelling a residue of essentially lint cotton and green bolls into a pneumatic secondary separator having a main airstream and an adjacent counter airstream flowing therein, wherein the main airstream is effective for initially separating a bulk of the lint cotton from the green bolls, any remaining lint cotton with the green bolls then enter the counter airstream which serves to return the same into main airstream for final separation of the lint cotton from the green bolls which gravitate into a collector.

3,618,762
CONTAINER-INSPECTING MACHINE

David F. Sklar, Kent Cliffs, N.Y.

Filed Feb. 20, 1969, Ser. No. 800,853
Int. Cl. B07c *5/02*
U.S. Cl. 209—80 **12 Claims**

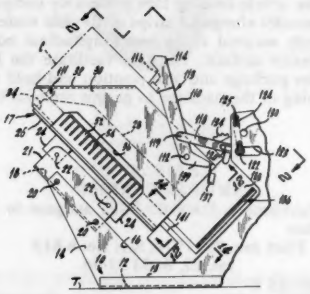


A machine and method for inspecting and sorting containers, such as glass bottles, that are acceptable from those not acceptable because of defects in the lip or shortness of the containers. A rotating test head has feelers thereon which are other than 180° apart and which can move relative to each other in a direction of the axis of the containers to actuate differential transformer means. The rotating testing head is employed to actuate a control circuit for ejecting a container if it is too short or if the lip does not fall within predetermined limits.

3,618,763
INFORMATION RETRIEVAL APPARATUS

Laurence Allan Cross, Jr., Groveville, N.J., assignor to Randomatic Data Systems, Inc.

Filed Jan. 5, 1970, Ser. No. 652
Int. Cl. B07c *3/18*
U.S. Cl. 209—80.5 **18 Claims**

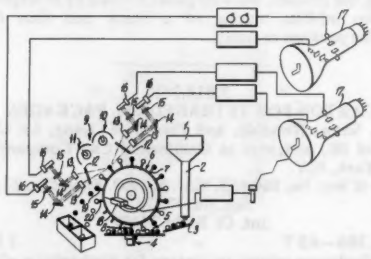


Cards that have been code-notched along one edge are randomly filed in capsules individually insertable in a card selector. A card is selected by code bars entering the notches and is then offset from the remaining cards by gravitational movement, facilitated by vibration of the cards. A rack in the capsule engages only an offset card and is meshed with a pinion. When the pinion is driven, it shifts the rack and the engaged card out of the capsule to a location where a card-transport device takes over to carry the card to a viewing, photographing, or card removal station.

3,618,764
PROCESS FOR INSPECTING PRINTED TABLETS AND CAPSULES USING COLOR RESPONSIVE SORTING MACHINES

Joseph A. Bawduniak, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

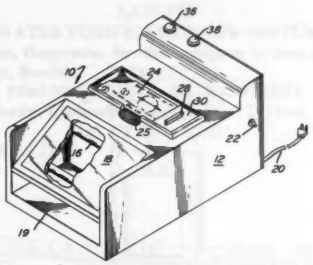
Filed Jan. 13, 1970, Ser. No. 2,605
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 **4 Claims**



Process for inspecting printed tablets and capsules using color-responsive sorting machines in which tablets having a coating of one color are printed with an ink of a contrasting

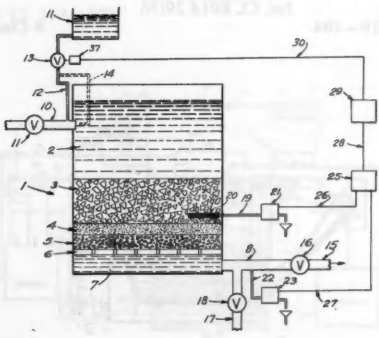
color which corresponds to the background color against which the tablets or capsules are viewed in the viewing chamber of the color-responsive sorting machine. In this way foreign tablets are rejected.

3,618,765
COUNTERFEIT CURRENCY DETECTOR
Bernard William Cooper, Syosset, and Jerome Rubler, Roslyn Heights, both of N.Y., assignors to Spectronics Corporation, Westbury, L.I., N.Y.
Filed Apr. 14, 1969, Ser. No. 815,565
Int. Cl. B07c *5/342*
U.S. Cl. 209—122 **6 Claims**



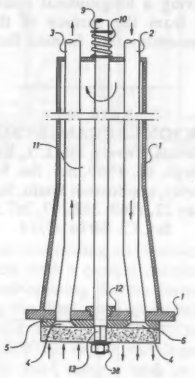
The apparatus disclosed detects counterfeit U.S. paper currency in a manner which is simple, quick, and requires little or not skill. Almost all official U.S. paper currency does not exhibit a chromamorphic response other than that naturally attributable to the cotton or linen stock. Almost all counterfeit currency will exhibit a definite chromamorphic response in the blue range when activated by properly filtered ultraviolet light. Any suspected counterfeits are further subjected to a test for determining the magnetic characteristics of the ink. Genuine U.S. paper currency for the last 25 years uses black ink which incorporates a magnetic pigment.

3,618,766
WATER TREATMENT
Edward F. Morey, Atlanta, Ga., assignor to The Taulman Company, Atlanta, Ga.
Filed Jan. 23, 1970, Ser. No. 5,173
Int. Cl. B01d *37/02*
U.S. Cl. 210—75 **8 Claims**



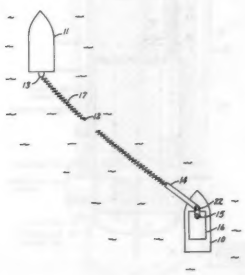
A method for precisely controlling the addition of filter aid chemicals to water treated in a high-rate filter apparatus, wherein turbidity measurements are simultaneously made of the water at an intermediate point in the filter bed and of the final filter effluent. The relationship of the turbidity measurements is used to constantly regulate the optimum addition of filter aid chemicals.

3,618,767
PROCESS AND APPARATUS FOR CONTINUOUS LIQUID SAMPLING
Gottfried Thummel, Mannheim-Waldhof, Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Germany
Filed Oct. 31, 1969, Ser. No. 872,482
Claims priority, application Germany, Nov. 6, 1968, P 18 07 230.5
Int. Cl. B01d *33/00*
U.S. Cl. 210—77 **18 Claims**



Clear samples of fluids containing solids suspended therein are continuously taken without filter-clogging using a filter apparatus immersed in the suspension comprising a rotatable filter disk divided by impermeable material into at least two sectors of liquid-porous material, in which the individual sectors are successively aligned, during each filter disk rotation cycle, in conduit relationship with both an afflux stream comprising liquid continuously withdrawn from the suspension and an efflux stream comprising the afflux stream after it has passed through a substantially closed cycle where the efflux stream passes through the sectors in a flow direction opposite to that of the afflux stream.

3,618,768
LIQUID SWEEPING SYSTEM EMPLOYING HELICAL CONVEYOR METHOD AND APPARATUS
Kenard D. Brown, 1227 South Willow St., Casper, Wyo.
Continuation-in-part of application Ser. No. 808,054, Mar. 18, 1969, now abandoned. This application May 8, 1970, Ser. No. 35,660
Int. Cl. B01d *21/06*
U.S. Cl. 210—83 **29 Claims**



A method and system for removing light fluid such as oil from heavy fluids such as water comprises an extended length of open screw conveyor constructed of material such

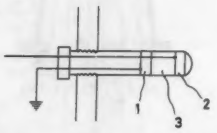
that it will float on water. The conveyor may comprise a helical fin having a central bead or core about which stranded cables are wound, the stranded cables may be of steel wire or plastic and when the conveyor is required to float on water, plastic materials are employed for all parts of the conveyor. The conveyor is connected to two spaced motor vessels one end being pivotally connected to one of the vessels for free rotation and the other end passing up into the other vessel through a surrounding conduit and being rotated by a motor mounted on the other vessel. A reservoir is provided in the other vessel to collect the liquid. During operation the cable is rotated in a direction to draw the liquid toward the reservoir vessel and the two vessels are moved forward to sweep an area covered with oil or other lighter fluid. In another embodiment the flexible helical drive member is housed in a flexible tubing having a longitudinal opening for admitting the lighter liquid from the surface of the body of heavy liquid, the entire assembly thus formed floats on the body of liquid.

3,618,769

APPARATUS FOR ION EXCHANGE PROCESS CONTROL

Manuel Adroer Iglesias, Tavern 50, 2, 1, Barcelona, Spain

Filed Sept. 12, 1969, Ser. No. 857,423
Claims priority, application Spain, Sept. 19, 1968, May 22, 1969; 358.307, 367.556
Int. Cl. B01d *35/14*
U.S. Cl. 210—85 **7 Claims**



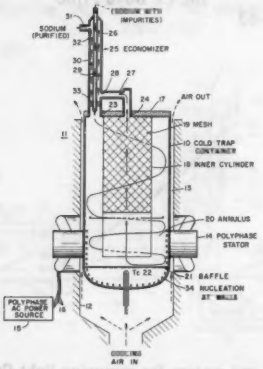
A method and apparatus for ion exchange process control which delivers a voltage proportional to the quotient of two resistances, a first resistance being measured between two electrodes disposed in a ion exchange bed near the point where the effluent leaves and a second resistance being measured between two electrodes in an insulated cell full of exhausted resin, the untreated liquid passing through the cell before entering the ion exchange device. The voltage is amplified and operates a reading instrument and delivers two signals, the presence or absence of such signals triggers a warning and/or an automatic regeneration process.

3,618,770

COLD TRAP

Lawrence E. Pohl, Los Gatos, and Prodyot Roy, Saratoga, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 4, 1970, Ser. No. 8,502
Int. Cl. B01d *35/06*
U.S. Cl. 210—85 **7 Claims**



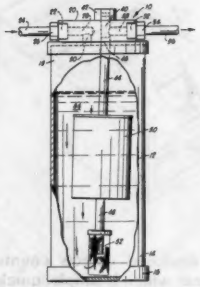
A device for collecting and storing impurities found in high-temperature sodium or other liquid metal loops of nuclear reactors. The effectiveness of nucleating and precipitating these impurities is increased by electromagnetic stirring of the cooled sodium. The electromagnetic stirring action of the sodium or other liquid metal is accomplished with a polyphase rotating magnetic field.

3,618,771

APPARATUS FOR DRYING REFRIGERANT

Robert M. Akers, and Harold L. Westfall, both of Oklahoma City, Okla., assignors to Akers, Incorporated, Oklahoma City, Okla.

Filed Sept. 10, 1969, Ser. No. 856,595
Int. Cl. B01d *17/06, 29/24*
U.S. Cl. 210—95 **1 Claim**



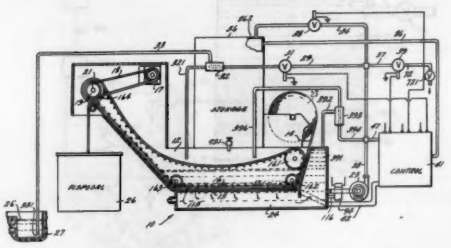
The present invention relates to improved apparatus for drying the refrigerant in refrigeration systems such as automobile air conditioners and the like. A refrigerant permeable desiccant retainer formed of a rigid impervious material having a quantity of particulated or beaded solid desiccant disposed therein is attached within a closed container. The closed container is connected in a refrigeration system downstream of the refrigerant condenser so that liquefied refrigerant passes therethrough. The desiccant retainer prevents the desiccant from escaping from the container and obviates the use of sack-type retainers formed of cloth heretofore used.

3,618,772

CONTROL SYSTEM FOR A VACUUM FILTER

Gerald P. Dietrick, 523 Ridgeview Drive, Florence, Ky.

Filed Feb. 26, 1970, Ser. No. 14,521
Int. Cl. B01d *29/36*
U.S. Cl. 210—104 **8 Claims**



A vacuum filter having a liquid-receiving tank, a filter medium underlying the tank, a vacuum-chamber-receiving

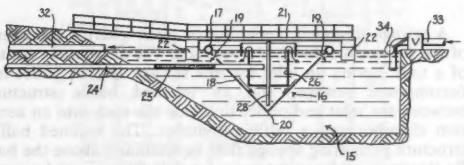
liquid from the filter medium, and a vacuum pump in communication with the vacuum chamber for withdrawing filtered liquid from the vacuum chamber. A control chamber is connected to the tank by a conduit so that a level of liquid is maintained in the control chamber substantially equal to the level of liquid in the tank. A control ejector receives a portion of the filtered liquid from the vacuum pump. A dip tube is connected to the control ejector and has an open end terminating at a selected liquid level. The ejector subjects the dip tube to a reduced pressure when the open end is covered with liquid. A valve which directs other filtered liquid from the pump is actuated by a pressure-operated device connected to the dip tube and to the valve.

3,618,773

WATER PURIFICATION APPARATUS

Sten Jacquet, Hagersten, Sweden, assignor to Sten Jaquet AB, Hagersten, Sweden

Filed Nov. 24, 1969, Ser. No. 879,091
Claims priority, application Sweden, Dec. 2, 1968, 16453/68
Int. Cl. B01d *21/02*
U.S. Cl. 210—123 **3 Claims**



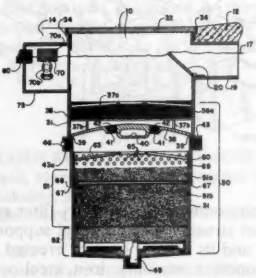
Contaminated raw or waste water is delivered into at least one basin which is supported within a water-filled reservoir. The contaminated water in said basin is subjected to mechanical, biological and/or chemical purification, and the treated effluent is caused to overflow into the reservoir. The basin has a conical wall of supple nonporous material that yields readily to even slight movements of the water both internally and externally of the basin unit.

3,618,774

COMBINATION SWIMMING POOL FILTER, SURFACE SKIMMER AND WATER LEVEL CONTROL DEVICE

Dale Delphia, Route 3, Box 164 A, Newberg, Oreg.

Filed Feb. 2, 1970, Ser. No. 7,561
Int. Cl. E04h *3/20*
U.S. Cl. 210—128 **23 Claims**



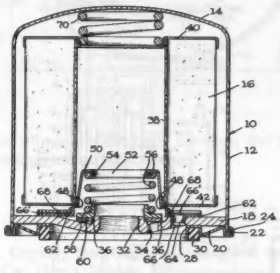
A swimming pool filter unit comprising filter and sand layers, some of the sand cleanable by removing a containing basket, the unit also having automatic pool fill control and overflow drain means.

3,618,775

FILTER ASSEMBLY CHECK AND RELIEF VALVES

William Herbert Hultgren, 6645 Emerald Lake Drive, Miramar Isles, Fla.

Filed July 25, 1969, Ser. No. 845,020
Int. Cl. B01d *34/14, 27/10*
U.S. Cl. 210—130 **1 Claim**



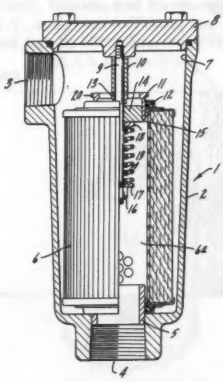
A spin-on oil filter comprising a cylindrical casing having a filter element therein with a closure member closing off one end having a central opening therein formed by a threaded nipple for screwing the filter onto an engine and discharging oil therefrom, oil inlet means surrounding said nipple, and oil bypass ports surrounds said nipple and disposed between said nipple and said oil inlet means, and an oil bypass valve disposed over said bypass ports and biasing means normally urging said bypass valve in a seated position, said bypass valve being disposed in parallel flow relationship with said oil inlet means and disposed within a sleeve upon which is seated an antidrainback valve, and said sleeve being disposed within the center tube of a filter element disposed within said casing.

3,618,776

FILTER ASSEMBLY BYPASS KIT

Walter J. Kudlaty, Elmhurst, Ill., assignor to Marvel Engineering Company, Chicago, Ill.

Filed Oct. 3, 1969, Ser. No. 863,478
Int. Cl. B01d *35/14, 27/10*
U.S. Cl. 210—130 **4 Claims**

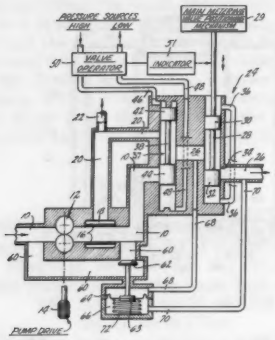


A filter assembly kit including a closure, a support rod removably secured to the closure, a spacer on the rod, and interchangeable plug and bypass valve elements alternately positionable on the rod.

3,618,777
LOW-FLOW CONTAMINATED FUEL TRANSFER SYSTEM FOR A FUEL CONTROL

Gene A. Meyer, Simsbury, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Dec. 15, 1969, Ser. No. 885,215
Int. Cl. B01d 29/36
U.S. Cl. 210—130 4 Claims

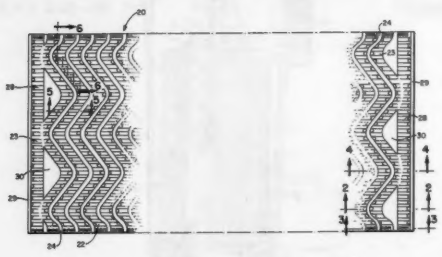


A fuel control system, adapted to handle contaminated fuel, has a primary fuel supply line incorporating a pump and a wash flow filter downstream of the pump. A bypass line containing a bypass valve communicates with the primary line at respective positions upstream of the pump and downstream of the filter. A secondary fuel supply line communicates with the filter to receive a flow of filtered fuel. A main fuel supply line includes a window-type metering valve which receives fuel from either the primary or secondary line via a transfer valve. At low flows the metering valve receives fuel from the secondary line so that it will not become clogged by contaminants in the fuel and at high flows contaminated fuel is delivered to the metering valve through the primary line.

3,618,778
LIQUID-TREATING APPARATUS

Joseph H. Benton, and Joseph A. Self, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Filed May 22, 1969, Ser. No. 827,011
Int. Cl. B07b 7/00
U.S. Cl. 210—150 8 Claims

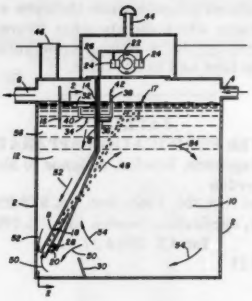


A liquid-treating unit particularly suited for the treatment of liquid waste by aerobic bacterial action includes a module made of alternate flat and corrugated sheets of a thermoplastic material. The corrugated sheets are joined to the flat sheets at the apices of the corrugations. The corrugations have flat apices and reinforced sidewalls to enhance the strength of the module.

3,618,779
SEWAGE TREATMENT APPARATUS

Gerald J. Goodman, Chomedey, Laval, Canada, assignor to Air-Gest International Corp., Montreal, Quebec, Canada

Filed Nov. 21, 1969, Ser. No. 878,843
Claims priority, application Canada, Oct. 31, 1969, 66,373
Int. Cl. C02c 1/12
U.S. Cl. 210—195 5 Claims

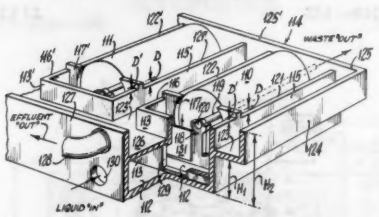


A sewage treatment apparatus or plant wherein treatment of the sewage is achieved by aeration. The apparatus consists of a tank having an inlet for raw sewage and an outlet for decomposed sewage, and an inclined baffle structure between the inlet and outlet to divide the tank into an aeration chamber and a settling chamber. The inclined baffle structure permitting sewage flow beneath and above the baffle structure, and a compressor for delivering air under pressure to an air diffuser positioned adjacent the lowermost portion of the inclined baffle structure whereby air in the form of bubbles issuing from the diffuser results in countercurrent flow in the aeration and settling chambers causing intimate mixing and aeration of all of the sewage in the tank. The apparatus also provides for means for returning scum from the surface of the settling chamber to the aeration chamber.

3,618,780
ROTARY WATER-FILTRATION APPARATUS

George R. Evans, 58 Nelson Ave., Harrison, N.Y.

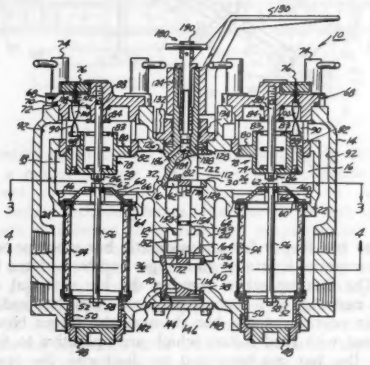
Continuation-in-part of application Ser. No. 787,106, Dec. 26, 1968, now Patent No. 3510002. This application Apr. 15, 1970, Ser. No. 28,782
Int. Cl. B01d 33/06
U.S. Cl. 210—232 15 Claims



The invention contemplates a rotary-filter system in which the end-support structure, for ultimate support of a filter or strainer drum and its axle, is built or erected at the installation site, of concrete, masonry, iron, steel or other suitable material; such structure may, for example, be integrally cast or molded with the concrete, masonry or the like formation of the basic tank structure into which the strainer is to be installed. The end-support structure is provided in opposed walls of a treatment chamber, and one of these walls is the inlet or upstream wall; in the case of the upstream wall, the support structure is a stool or pedestal extending upwardly at

the inlet to the interior of the drum, and at the other end of the support structure is formed in or as a part of the opposite end wall. Axle-loaded bedplates are adjustably securable on each end-support structure, to assure correct axle orientation and alignment at the site. Once thus aligned, the bedplates are secured, and the axle is fastened in place with its revolvably mounted drum necessarily also in place. Seal, drive, and other finishing connections are then made.

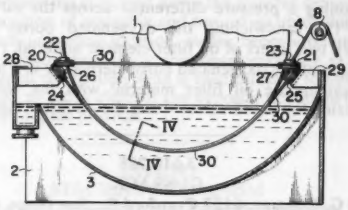
3,618,781
DUPLEX FILTERING DEVICE
Carl A. Brown, Birmingham, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Aug. 22, 1969, Ser. No. 852,261
Int. Cl. B01d *35/12*
U.S. Cl. 210—341 **10 Claims**



A duplex filtering device having an inlet port and an outlet port provided with a pair of chambers separated by a common partition, each chamber having a filter element with an inlet and an outlet passageway respectively adapted to be connected to the inlet and the outlet ports of the filtering device. A valve member is disposed at each end of the partition, one of the valve members being adapted to be rotatably shifted from a first position for connecting one of the inlet passageways to the inlet port and to a second position for connecting the other inlet passageway to the inlet port, while the other of the valve members is adapted to be rotatably shifted from a first position for connecting one of the outlet passageways to the outlet port, and to a second position for connecting the other outlet passageway to the outlet port; the pair of valve members being connected to each other for simultaneous movement by means of a universal link extending through the common partition. A third valve carried within the device fluidly connects the two chambers to balance the pressure therein so as to permit shifting of the pair of valve members between their first and second positions.

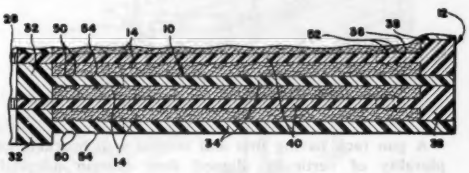
3,618,782
CONTINUOUS ROTARY DRUM VACUUM FILTER
Akitoshi Iwatani, Marugame, Japan, assignor to Ishigaki Kiko Co., Ltd., Sakaide, Japan
Filed May 21, 1969, Ser. No. 826,412
Int. Cl. B01d *33/14*
U.S. Cl. 210—401 **6 Claims**

In a continuous rotary drum vacuum filter of the type employing a filter medium in the form of an endless belt which is entrained over the drum and over rolls spaced from the drum, a device for preventing the intrusion of unfiltered slurry into filtering chambers in the drum through the clearance between the drum and the filter medium comprising a pair of endless pressure belts which press the filter medium against both sides of the drum in the portion of the drum that is immersed in a slurry tank. The pressure belts press the filter medium into channels in the edge of the drum and effect a



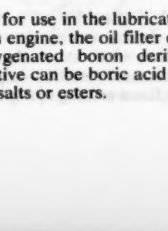
tight seal that eliminates leakage between the filter and the drum in the immersed portion thereof.

3,618,783
FILTER
Kenneth W. Cuyler, Deerfield, Ill., assignor to William W. Nugent & Co., (Inc.), Skokie, Ill.
Filed Oct. 17, 1969, Ser. No. 867,333
Int. Cl. B01d *29/34*
U.S. Cl. 210—492 **6 Claims**



A filter having a plurality of axially aligned and axially spaced flat annular disks of filtering material separated by inner and outer support members alternating axially with the respective disks and having radial spokes providing axial support for the central portions of the disks intermediate their peripheries and terminating in circumferentially widened portions cooperating with adjacent support members to define inlet and outlet openings communicating with the spaces between the disks for the flow of fluid axially through the disks.

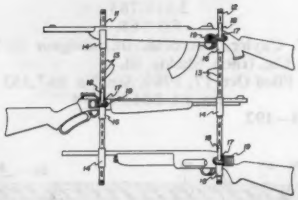
3,618,784
RUST-INHIBITING OIL FILTER ELEMENT
Walter W. Hellmuth, Beacon, and Raymond C. Schlight, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Jan. 8, 1969, Ser. No. 789,737
Int. Cl. B01d *39/00*
U.S. Cl. 210—493 **17 Claims**



An oil filter suitable for use in the lubricating oil system of an internal combustion engine, the oil filter element of which has an adherent oxygenated boron derivative. The oxygenated boron derivative can be boric acid and/or any of its dehydration products, salts or esters.

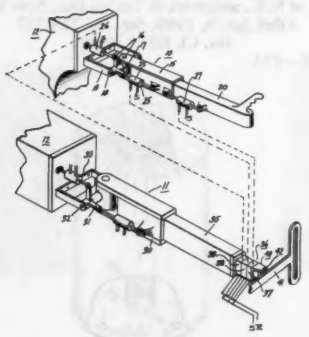
The methods of dispersing the oxygenated boron derivative in the oil filter element include (1) accelerating the oxygenated boron derivative toward the oil filter element by maintaining a pressure differential across the oil filter element; (2) sandwiching the oxygenated boron derivative between two layers of oil filter element material; (3) making a solution of the oxygenated boron derivative in a liquid vehicle, soaking the oil filter material with the solution and volatilizing the liquid vehicle from the oil filter element.

3,618,785
GUNRACK
Albert G. Newman, 6157 Crawford St., San Diego, Calif.
Filed Oct. 10, 1969, Ser. No. 865,438
Int. Cl. E05b *73/00*
U.S. Cl. 211—4 **1 Claim**



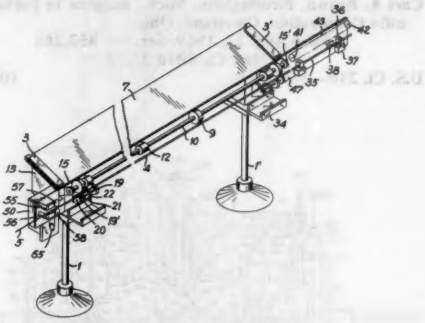
A gun rack having first and second wall brackets with a plurality of vertically aligned slots therein adapted for cooperation with first and second gun brackets dimensioned for receiving a rifle therein; one of the brackets having a locking member cooperating with the wall bracket for locking the gun in position.

3,618,786
MATERIAL-HANDLING APPARATUS WITH END EFFECTOR FORCE RESOLVER AND FEEDBACK
Bruce R. Fick, Ballston Lake, N.Y., assignor to General Electric Company
Filed Jan. 2, 1969, Ser. No. 788,402
Int. Cl. B25j *3/04*
U.S. Cl. 214—1 CM **5 Claims**



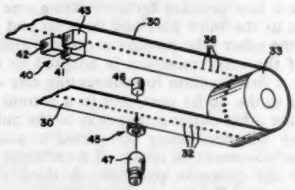
Force feedback is provided to a master member from a slave member by forces sensing elements located at the end of the slave member which exerts the force and by actuators located at the master member responsive to the signals developed by the force-sensing elements.

3,618,787
FINE BAR FEEDER FOR AUTOMATIC BAR MACHINE
Kenji Nemoto, Tokyo, and Masaru Nakajima, Chiba, both of Japan, assignors to Seiko Seiki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 16, 1970, Ser. No. 11,708
Claims priority, application Japan, Feb. 17, 1969, 44/11089
Int. Cl. B65h *5/16*
U.S. Cl. 214—1.5 **1 Claim**



A fine bar feeder for an automatic bar machine wherein the bar material is fitted with a finger and housed in a feeding tube. The feeding tubes carrying the bar material are fed from a cartridge to a feeding position. A pusher rod pushes the rear portion of the bar through the finger block into alignment with feed rollers which are operative to feed the bar to the bar machine and to discharge the remaining unused portion of the bar.

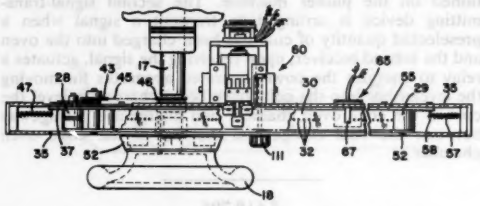
3,618,788
PAPER CUTTER CONTROL
James E. Murray, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Jan. 8, 1970, Ser. No. 1,406
Int. Cl. B23q *5/22*
U.S. Cl. 214—1.6 **9 Claims**



A position control circuit for slowing the movement of a high-inertia member prior to stopping at a preselected position includes a position control tape having magnetic pulse-generating marks stored thereon to define desired stopping positions of the member. A pair of pulse-sensing means scans the control tape with the first pulse-sensing means conditioning an electronic counter, the output of which controls the speed of the drive means. A second pulse-sensing means stops the member at the desired position. Position-indicating marks are also included on said control tape and are sensed by a third pulse-sensing means which supplies an input to the counter. After stopping, the drive means will restart at the higher speed unless other marks are detected by the first pulse-sensing means which have not yet been detected by the second pulse-sensing means, in which case the drive means will restart at the lower speed. In all cases, the control tape will move a distance at least equal to the distance between the first pulse sensing means and the second pulse sensing

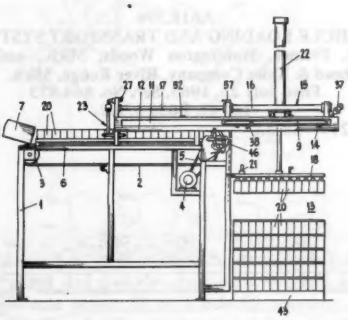
means before the counter returns to its predetermined status to insure that no additional stop marks are located between the sensing heads.

3,618,789
MATERIAL CUTTER CONTROL APPARATUS
Dorse James Young, Centerville, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Jan. 8, 1970, Ser. No. 1,407
Int. Cl. B23q 5/50
U.S. Cl. 214—1.6 7 Claims



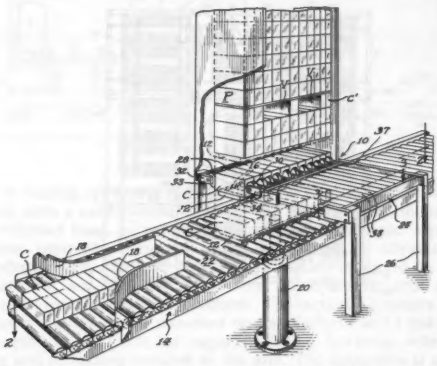
A control apparatus for a material-positioning device includes a magnetic tape which moves, in response to the movement of a machine element, relative to magnetic sensing and/or recording heads. The assembly which supports the heads is indexed in a direction perpendicular to the direction of relative movement to define a plurality of tracks on the magnetic tape. A mechanism moves the head assembly a predetermined distance for each indexing movement When the head assembly reaches one extremity of the tracks, its indexing direction of movement is reversed, and the heads are repositioned to define tracks on the tape which alternate with the tracks defined by the head assembly when moving in the first direction. An adjustment cam is provided to move the head assembly in the direction of relative movement for accurate alignment of the machine element. The magnetic tape is continuous and is moved synchronously with the machine element by means of a chain driven by a lead screw. The chain is tensioned by a first spring and the tape is tensioned by a second spring having a spring constant less than the first spring.

3,618,790
APPARATUS FOR ASSEMBLING AND DEPOSITING LAYERS OF ARTICLES
Joseph T. Carmody, 100 Balaclava Road, Shepparton, Victoria, Australia
Filed Aug. 29, 1969, Ser. No. 854,118
Int. Cl. B65g 57/04
U.S. Cl. 214—6 FS 14 Claims



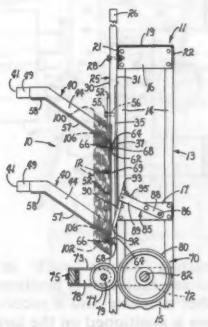
An apparatus includes a conveyor for assembling rows of containers or the like against a stop. A transfer carriage, movable back and forth, is included, having a suction head adaptable to grip and release the containers by means of a vacuum applied thereto. A control circuit is included, and is operable by a fluid medium to actuate the transfer device to a gripping position, connect the suction head to a source of vacuum, release the stop, and move the transfer device away from the position of assembly and toward an unloading location. At such unloading location, means become operable to lower the suction head to a container-depositing position. The vacuum at the suction head is then released to allow the suction head to move clear of the deposited containers, and return to its original position.

3,618,791
STACKING MECHANISM
Thomas C. Potter, Frankfort, and Edward J. Stahnke, Riverdale, both of Ill., assignors to Interlake Steel Corporation
Filed Nov. 28, 1969, Ser. No. 880,651
Int. Cl. B65g 57/30
U.S. Cl. 214—6 BA 7 Claims



A stacking mechanism for stacking a plurality of articles in a vertical stack includes an elevatable platform and a plurality of pairs of opposed rollers or pawls which are rotatable in one direction by the articles when the platform is elevated to position a course of the articles between the opposed rollers or pawls, but which do not rotate in the other direction when the platform is lowered. The rollers or pawls are urged against the articles in the course which is positioned between them, whereby successive courses may be added to the stack and the stack is supported by the rollers.

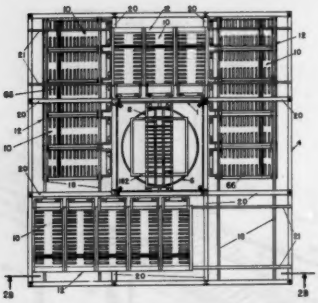
3,618,792
MAT FEEDING MAGAZINE
Gerald C. Paxton, Sanger, Calif., assignor to General Nailing Machine Corporation
Filed Sept. 29, 1969, Ser. No. 861,708
Int. Cl. B65g 59/00
U.S. Cl. 214—8.5 F 10 Claims



A mat-feeding magazine for use with a reciprocal member to propel said mats along a predetermined path providing an

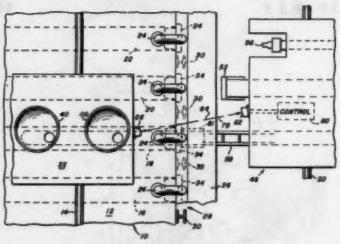
inclined ramp adapted to hold a plurality of substantially flat mats in substantially upright position thereon having an upper mat loading end and an opposite lower mat discharge end adjacent to said path and including mat restraining means at said discharge end of the ramp being effective to preclude inadvertent or multiple feeding of said mats from the magazine by said reciprocal member.

3,618,793
ELEVATOR TURNTABLE-TYPE MECHANICAL AUTO PARKING SYSTEM
Ralph W. Coursey, 1414 E. Wilshire, Oklahoma City, Okla.
Filed Feb. 7, 1969, Ser. No. 797,549
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 CD **6 Claims**



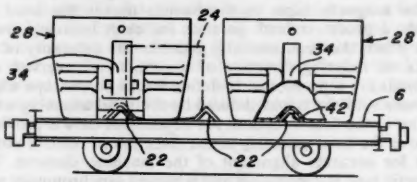
This invention discloses a system, mechanically operated that will park, store and unpark automobiles reversed in direction from their parked direction, and one which is especially adapted for installation in high demand areas where sites are costly and conventional parking systems impractical.

3,618,794
METHOD AND APPAPARATUS TO INTERLOCK A LARRY CAR AND A PUSHER MACHINE
Edward J. Helm, Pittsburgh, Pa., assignor to Koppers Company, Inc.
Filed May 2, 1969, Ser. No. 821,412
Int. Cl. C10b *31/04*
U.S. Cl. 214—23 **17 Claims**



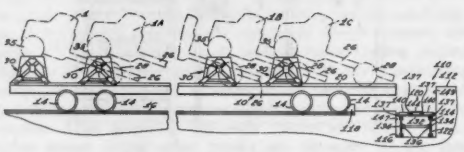
A signal-transmitting device such as a source of columnated gamma ray radiation is positioned on the upper structure of a pusher machine and a receiver responsive to gamma ray radiation is positioned on the larry car. An actuator device such as an electrical relay is arranged to control the power-operated apparatus for discharging the coal from the hoppers on the larry car and is arranged to be actuated by the signal-transmitting device through the receiver. The signal transmitted by the signal device on the pusher machine is directional and is only received by the receiver on the larry car when the leveler bar on the pusher machine is in position to level the coal in the same oven which the larry car is in position to charge. The power-operated apparatus for discharging the coal from the hoppers on a larry car into the oven remains deenergized until the relay is actuated by the signal transmitted from the pusher machine. With this arrangement, the oven can not be charged with coal from the larry car until the leveling bar is in position to level the charge in the same oven. A second signal-transmitting device is positioned on the larry car and a second receiver is positioned on the pusher machine. The second signal-transmitting device is arranged to transmit a signal when a preselected quantity of coal has been charged into the oven and the second receiver, upon receiving the signal, actuates a relay to energize the power-operated apparatus for moving the leveler bar into the coke oven being charged to level the coal in the coke oven chamber and maintain a passageway between the coal charge and the top of the coke oven chamber.

3,618,795
CHARGING BOX FOR AN OPEN HEARTH FURNACE
Charles J. Burch, Lower Makefield Township, Bucks County, Pa., assignor to United States Steel Corporation
Filed Aug. 18, 1969, Ser. No. 850,850
Int. Cl. F27d *3/06, 3/12*
U.S. Cl. 214—31 **4 Claims**



A box for charging scrap into an open-hearth furnace has a longitudinal triangular groove in its bottom with flat portions on each side. In charging the furnace scrap is placed in a plurality of these boxes which are placed on a charging car having a plurality of spaced apart transverse triangular projections. Each box is positioned with its groove fitting over one of the projections. The scrap is then charged in the usual way. Other additives, such as iron ore and limestone, are placed in smaller boxes having a width such that the boxes can be held in position on the car between adjacent triangular projections. The small boxes so positioned are unloaded into the furnace in the usual way.

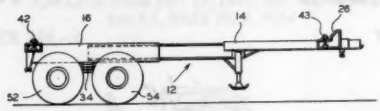
3,618,796
VEHICLE LOADING AND TRANSPORT SYSTEM
Israel D. Peisner, Huntington Woods, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.
Filed July 25, 1969, Ser. No. 844,873
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 BA **5 Claims**



The invention is embodied in a vehicle transport, in this instance a rail car, having a plurality of upright pedestals adapted to support the front wheels of vehicles arranged in

tandem on the transport. Apparatus is also provided for transferring the pedestals and vehicles to or from the transport.

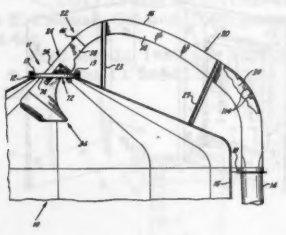
3,618,797
LOAD TRANSFER DEVICE AND METHOD
Robert A. Pratt, Harbert, Mich., assignor to Clark Equipment Company
Filed Sept. 30, 1969, Ser. No. 862,233
Int. Cl. B65g 67/02
U.S. Cl. 214—38 BA 7 Claims



A device for transferring a load container to a dock from a truck employs a telescoping rear truck trailer chassis portion movable relative to a front portion with support of the load container on the supporting surfaces of said chassis portions arranged for relative sliding movement with the under surface of the container on forward and reverse movement of the truck thereby to slide the container onto the dock.

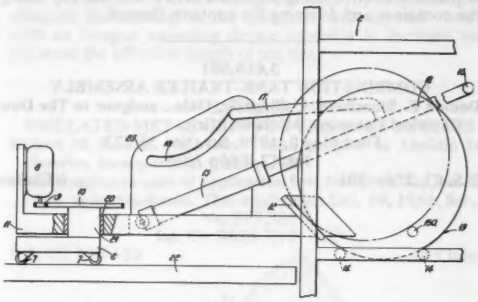
A method of transferring a load container from a truck to a dock by a series of relative sliding movements between the container and portions of the truck; first projecting the rear portion of the container onto the dock by reverse drive while a rear portion of the truck telescopes under the container; subsequently sliding the truck trailer rear and front portions forward under the container by forward drive of the truck; and pushing the container further into storage position on the dock with reverse drive again. A modified form leaves the container with its rear end on the edge of the dock and the front portion resting on a removable support.

3,618,798
DISTRIBUTOR SPOUT FOR GRAIN AND SILAGE
Melvin E. Dreier, Dumont, Iowa
Filed Feb. 9, 1970, Ser. No. 9,692
Int. Cl. B65g 53/40, 65/32; B02c 9/00
U.S. Cl. 241—39 5 Claims



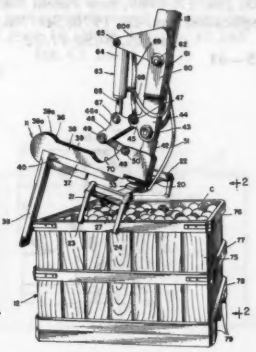
A spout structure, attachable to a fill pipe, for directing grain and silage into a silo is adaptable with slight modification for either a center fill or a side fill operation and includes a plurality of different directional flow channels that divide the grain and silage so that there is uniform distribution of the same within the silo. One embodiment of this spout is designed especially for use with corn and includes certain obstructions in the flow channels for cracking the corn during delivery of the same to the silo.

3,618,799
LOADING APPARATUS FOR A CABLE STRANDING MACHINE
Ronald Yaxley Gill, Ilford, and William George Cook, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Apr. 7, 1970, Ser. No. 26,383
Claims priority, application Great Britain, Apr. 16, 1969, 19,336/69
Int. Cl. B60p 1/48
U.S. Cl. 214—77 7 Claims



A loading apparatus is mechanized to load conductor bobbins onto a cable-stranding machine. The apparatus includes a wheeled base, an axle rigidly attached to the base, a platform rotatably mounted about said axle, a retractable hydraulic arm, one end of which is pivotally mounted on the platform, an actuating means for the hydraulic arm and means for rotating the platform. The actuating means includes a guide rigidly mounted on the platform and a linkage coupled to the guide for imparting lifting, lowering, extending and retracting motions to the arm. The apparatus is supplied with a scoop at a periphery of the platform and a holding bar at the end of the arm to lift up a bobbin while the holding bar presses the bobbin against the scoop. The apparatus may be adapted to load two or more bobbins simultaneously. Full bobbins are located in a storage rack running parallel with a carriage in the stranding machine and the loading apparatus is positioned between the rack and the carriage to automatically unload empty bobbins from the carriage and replace them with full bobbins from the rack.

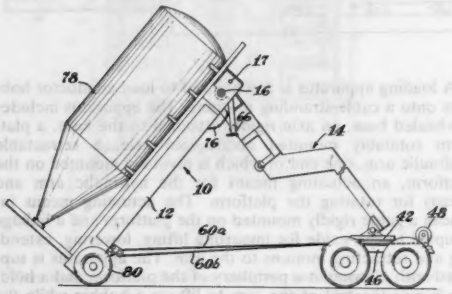
3,618,800
CONTAINER-DUMPING APPARATUS
Vencil Collins, Haines City, and John E. Petersen, Lake Wales, both of Fla., assignors to Petersen Industries, Inc., Lake Wales, Fla.
Filed Oct. 23, 1969, Ser. No. 868,682
Int. Cl. B65g 67/22, 67/46
U.S. Cl. 214—313 9 Claims



A container-dumping apparatus particularly suitable for use with citrus and the like. The apparatus includes a grapple

swingably mounted on a lift device such as a crane or boom. The grapple includes an elongated lift bar and a generally L-shaped support arm. The lift bar pivotally carries a clamp on each end thereof, and the clamps are operatively connected to a hydraulically operated piston carried by the lift bar for movement into and out of a container-engaging position. The support arm extends away from the bar and includes a generally horizontally extending base portion and a downwardly extending leg portion which is adapted to extend along the side of a container to be dumped. A hydraulic cylinder is pivotally mounted on the lift device, and the piston associated therewith is extendible to cause the support arm and lift bar to swing about the lift device, thereby tilting the container and dumping the contents thereof.

3,618,801
COMBINATION TANK-TRAILER ASSEMBLY
Donald E. Blanchard, Collinsville, Okla., assignor to The Dow Chemical Company, Midland, Mich.
Filed May 8, 1970, Ser. No. 35,773
Int. Cl. B60p *1/04*
U.S. Cl. 214—501 **6 Claims**

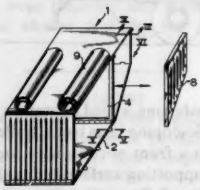


The invention concerns a tank-erecting trailer unit in which the trailer may be hauled to the location when the tank is to be erected, and then the trailer is pivoted at its hinge point by cable means to raise the tank to a vertical position. The cable means extend between the rear of the trailer and a winch located at or near the forward end of the trailer.

3,618,802
DISTORTION PREVENTER
George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio
Continuation-in-part of application Ser. No. 781,556, Dec. 5, 1968, now Patent No. 3,499,574, and a continuation-in-part of 791,933, Jan. 17, 1969, now Patent No. 3,532,544. This application Jan. 26, 1970, Ser. No. 883,869
Int. Cl. B65d *41/22*
U.S. Cl. 215—41 **12 Claims**

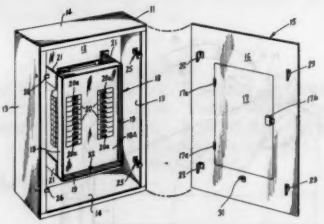
A distortion preventer bead on a container body is spaced from another bead, which cooperates with an adjacent peripheral leg of a closure to provide a locking engagement of the closure and the container body, and serves to limit any pivotal motion by the leg in the direction of the container body.

3,618,803
AIRFREIGHT CONTAINER
Manfred Dobberkau, Herborn; Helmut Lukas, Bicken, and Kurt Luckhoff, Frohnhausen, all of Germany, assignors to Burger Eisenwerke Aktiengesellschaft, Herborn/Dillkreis, Germany
Filed Aug. 14, 1969, Ser. No. 850,062
Claims priority, application Germany, Nov. 19, 1968, P 18 09 634.9
Int. Cl. B65d *7/24*
U.S. Cl. 220—1.5 **8 Claims**



A collapsible airfreight container of generally prismatic configuration having a rectangular parallelopipedal main portion including a base, sidewalls and a top, and a trapezohedral cantilevered portion extending laterally of the main portion and projecting beyond the base, the container being collapsible by virtue of hinged junctions between the rectangular sidewalls, base and top. The main section is provided with openings over its entire sidewalls which are closed by flexible covers adapted to be rolled up, while trapezoidal stiffening inserts from the sidewalls of the cantilevered compartment.

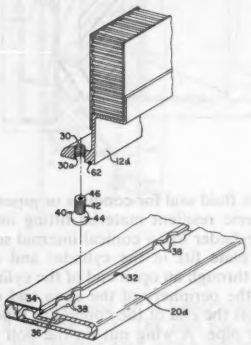
3,618,804
CONCEALED TRIM CLAMP FOR ELECTRICAL PANELBOARDS AND OTHER WIRING CABINETS
Werner A. Krause, West Hartford, Conn., assignor to General Electric Company
Filed Oct. 20, 1969, Ser. No. 867,778
Int. Cl. H02g *3/08*
U.S. Cl. 220—3.8 **4 Claims**



A concealed front cover or "trim" fastener for electrical panelboards or other wiring cabinets comprising four hooks fixedly attached to the inside of the front cover. Four support arms or brackets are attached to the inside of the panelboard or cabinet and have bent-over portions onto which the hooks of the front cover may be placed to support the front cover. The support arms are slidably adjustable in a direction perpendicular to the plane of the front cover (i.e., toward and away from the backwall of the cabinet). In one form, the cover is substantially larger than the cabinet, and when the cabinet is recessed into a wall, the outer edges of the front

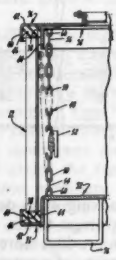
cover overlie peripheral portions of the wall and the cover is spaced away from the cabinet slightly. The support arms are drawn out to accommodate this spacing, and then fixed in place, such as by a nut and bolt. A locking screw mounted on a fixed portion of the cabinet is advanced after the front has been mounted in place and engages a bracket fixedly carried by the front cover and prevents the front cover from being raised so as to disengage the hooks from the adjustable support arms, thereby locking the front in place.

3,618,805
CARGO CONTAINER OR THE LIKE
Oscar W. Meller, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Division of Ser. No. 808,481, Mar. 19, 1969, Pat. No. 3,563,578. Filed July 15, 1970, Ser. No. 54,981
Int. Cl. B65d *7/28, 7/24*
U.S. Cl. 220—6 **7 Claims**



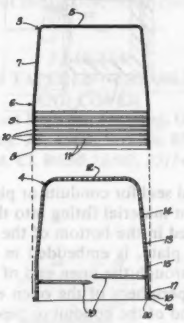
The invention relates to a cargo container or the like constructed of panels which have unique joints specifically adapted for quickly assembling or disassembling the container. Specifically, a unique flexible hinge arrangement is provided for vertical joints, while a quick-fitting locking arrangement is provided at all base horizontal joints. The base joint comprises a flange on the vertical member mating with a recessed beveled groove on the base member, and a plurality of screws threadably received in the flange of the vertical member having tapered heads slidably received in the beveled groove of the base member whereby when the screws are tightened, they lock into the groove of the base member and secure the vertical member to the base member.

3,618,806
COLLAPSIBLE CONTAINER
Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc.
Filed May 24, 1967, Ser. No. 640,930
Int. Cl. B65d *7/30, 45/06*
U.S. Cl. 220—7 **7 Claims**



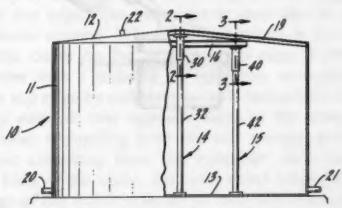
A collapsible container for storing and transporting relatively large quantities of packaged bulk material embodying sidewalls fabricated of a relatively rigid material having a hinge arrangement between adjacent walls formed of an elongate strip of relatively bendable and fluid-impervious material so that the walls may be maneuvered to an open position when the container is assembled to receive material and to a flattened position, with at least portions of adjacent sidewalls in contact with each other, when the container is emptied and disassembled. In addition, at least one end closure is provided having a receptacle attached to and circumscribing the end closure designed to receive the end edges of the walls in pressurable contact when the container is assembled thereby to form a relatively fluidtight seal therebetween, such pressurable contact being provided by a plurality of elongate ties secured to the container and the end closure with an integral camming device operable to increase and decrease the effective length of the ties.

3,618,807
INSULATED METAL CUPS FOR THERMOS BOTTLES
Robert M. Rownd, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Continuation-in-part of application Ser. No. 519,072, Jan. 6, 1966, now abandoned. This application Oct. 19, 1966, Ser. No. 587,881
Int. Cl. B65d *7/12, 7/22*
U.S. Cl. 220—10 **19 Claims**



A thermos bottle cup having a cup-shaped metal outer shell and a cup-shaped plastic liner. The upper edge of the shell is engaged with an annular outwardly projecting flange formed in the upper edge of the liner, and the cylindrical upper portions of the liner and shell are tightly fitted together. A quantity of adhesive is disposed between the cylindrical portions.

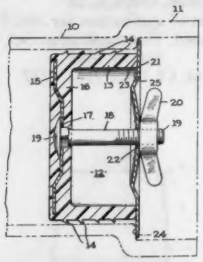
3,618,808
STORAGE TANK
Reign C. Ulm, and Mark D. Kinghorn, both of Schereville, Ind., assignors to Aerojet-General Corporation
Filed June 10, 1970, Ser. No. 45,165
Int. Cl. B65d *25/24*
U.S. Cl. 220—18 **11 Claims**



A method and apparatus for removing deformations from a roof structure of a storage tank of the type wherein the roof

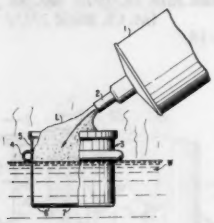
is supported by a plurality of support columns. The method comprises the steps of: (a) creating an upward force against the underside of the roof structure thereby increasing the length of the columns; and (b) removing the upward force while retaining the columns in their increased length. The apparatus provides a storage tank having a plurality of support columns adjustable in length and specific means to retain the columns in an increased length.

3,618,809
RELEASABLE FLUID SEAL FOR CONDUITS
Paul D. Martino, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.
Filed Sept. 3, 1969, Ser. No. 854,991
Int. Cl. B65d *39/12*
U.S. Cl. 220—24.5 **1 Claim**



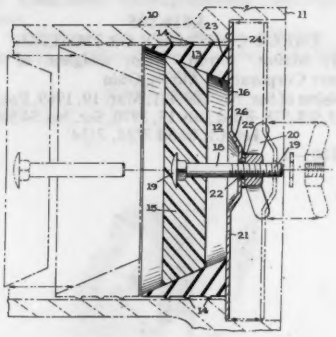
A releasable fluid seal for conduits or pipes has a cup of an elastomeric resilient material fitting into the pipe or conduit. A plate is embedded in the bottom of the cup and a bolt extends through the plate, is embedded in the bottom of the cup and extends through the open end of the cup. A second plate engages the periphery of the open end of the cup and also engages the end of the conduit or pipe or engages in the bell of the pipe. A wing nut on the bolt draws the two plates toward each other and bows the cup into fluidtight sealing engagement with the inner wall of the conduit or pipe.

3,618,810
SHAVING LATHER MOISTENING AND HEATING DEVICE
Henry Allen Wilson, 81 Atherton Ave., Atherton, Calif.
Filed Oct. 21, 1969, Ser. No. 868,039
Int. Cl. B65d *51/24*
U.S. Cl. 220—24 R **3 Claims**



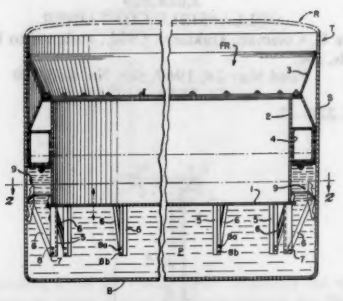
A combined aerosol-dispensed shaving lather confining, moistening and heating device which device also serves to enclose and protect the aerosol dispensing nozzle and valve when not being used.

3,618,811
RELEASABLE FLUID SEAL OR TEST PLUG FOR CONDUITS
Paul D. Martino, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.
Filed Sept. 15, 1969, Ser. No. 857,790
Int. Cl. B65d *39/12*
U.S. Cl. 220—24.5 **1 Claim**



A releaseable fluid seal for conduits or pipes has a cylinder of an elastomeric resilient material fitting into the pipe or conduit. The cylinder has a conical internal surface. A truncated conical plate fits in the cylinder and a bolt extends from the plate through an open end of the cylinder. A second plate engages the periphery of the open end of the cylinder and also engages the end of the conduit or pipe or engages in the bell of the pipe. A wing nut on the bolt draws the two plates toward each other and bows the cylinder into fluidtight sealing engagement with the inner wall of the conduit or pipe. An externally threaded hollow tube passing through the conical plate may be used in place of the bolt when the seal is to be used as a test plug.

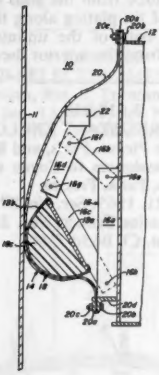
3,618,812
WAX SCRAPER FOR FLOATING ROOF TANKS
Harold A. Maeder, Coraopolis; Ardell H. Nelson, Coraopolis, and Franklin R. Neely, Sewickley, all of Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.
Filed June 27, 1969, Ser. No. 837,252
Int. Cl. B65d *87/20*
U.S. Cl. 220—26 S **23 Claims**



A wax scraper for removing waxy deposits from the inside surface of the wall of storage tanks, comprising a floating roof structure floating on product stored in the tank and having affixed thereto a plurality of support means, each support means carrying a scraper blade having scraper blade guiding or controlling means attached thereto for guiding the scraper blades over obstructions, such as seam welds or the like, on

the inside surface of the tank as the floating roof structure rises and falls with the level of product stored in the tank.

3,618,813
FLEXIBLE SEAL FOR A VAPOR CAVITY
Martin A. Nishkian, Long Beach, and Wayne E. Nuttall, San Gabriel, both of Calif., assignors to United States Steel Corporation
Filed Nov. 24, 1969, Ser. No. 879,022
Int. Cl. B65d *87/18*
U.S. Cl. 220—26 **5 Claims**



A flexible seal is disclosed for a vapor cavity between a tank shell and a floating roof. The seal has a quadrilateral type linkage on the floating roof which linkage has a fixed link and movable links. A flexible wear cover member is on the floating roof. A contact member is mounted on one of the movable links, adjacent the wear cover member, the contact member having a mounting plate, a cover member and a flexible core member between the mounting plate and the cover member. A counterweight means is on one of the movable links and is operable to force the contact member into contact with the wear cover member so that the wear cover member seals the vapor cavity.

Further, a flexible seal is disclosed having a support member secured at one end to the floating roof, and a tubular-sealing member having a wear cover member provided with flanges at each end and a flexible core member. The sealing member has one flange secured to the free end of the support member and the other flange secured to the other end of the floating roof. The sealing member is operable to seal the vapor cavity.

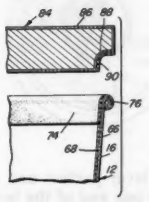
In addition, a seal is disclosed having a mounting member pivoted on the floating roof and a sealing member carried by the free end of the mounting member for sealing the vapor cavity. The sealing member has a rigid core member, a flexible core member surrounding the rigid core member, a wear cover member disposed about the flexible core member, and a support member extending through the sealing member and secured to the rigid core member and to the wear cover member.

Also, a rectangular self-energizing seal is disclosed having a sealing member provided with a rigid inner core member; a flexible inner core member disposed about the rigid inner core member; a rigid outer core member disposed about the flexible inner core member; rigid end section members covering the rigid outer core member, the flexible inner core member, and the rigid inner core member; a flexible outer core member disposed about the rigid outer core member, and the rigid end section members; a wear cover member covering the flexible outer member and the rigid end section members; a support rod extending through the sealing member and secured to the rigid end section members, a pair of generally diagonally disposed scuff pads projecting from the wear cover member, and generally diagonally disposed sealing surfaces on the outer flexible layer. A mounting rod is pivoted on the floating roof and pivotably connected to one of the scuff pads. A counterweight rod is pivotable on the other scuff pad, and a counterweight means is carried by the counterweight rod to force the sealing surfaces into sealing engagement with the tank shell and the floating roof.

Again, a flexible substantially square seal is disclosed having a mounting member pivoted on the floating roof and depending into the vapor cavity, a sealing member connected to the mounting member and having a flexible inner core member; a rigid inner core member disposed about the flexible inner core member; rigid end section members covering the rigid inner core member and the flexible inner core member; a flexible outer core member adjacent the rigid end section members and the rigid inner core member; and a scuff pad surrounding the rigid end section members and the flexible outer core member; a support rod extending through the sealing member and connected to the rigid end section members and to the mounting member. The scuff pad and the flexible outer core member are deformable to seal the vapor cavity.

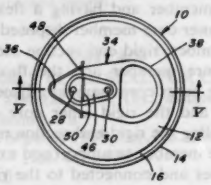
Further, a rotary circular seal is disclosed having a mounting member pivoted at one end of the floating roof, an annular member carried by the other end of the mounting member and rotatable in the mounting member, and a sealing member on the annular member and having a rigid inner core member disposed about the annular member; a flexible outer core member surrounding the rigid inner core member; and a scuff pad about the flexible outer core member.

3,618,814
RECTANGULAR TAPERED NESTABLE WASTE CAN AND COVER
Adolph Nagroski, East High St., Flushing, Ohio
Filed Aug. 25, 1969, Ser. No. 852,603
Int. Cl. B65d *53/00, 25/14*
U.S. Cl. 220—46 R **3 Claims**



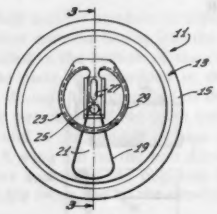
This garbage or trash can is a vermin-proof, tapered, rectangular open top container and cover, the container being nestable with similar containers for storage or shipping. The container is of heavy plastic, or of metal having an interior plastic coating. Sealing material is provided between the cover and the container for providing a vermin-proof closure on the container. The cover is held tightly against the container top either by resilient means, or by being of heavy material. When of heavy material, the cover is a one piece item, with handles, and a curved, recessed edge or lip complementary to an outwardly extending beaded edge on the container top edge. The heavy cover may also be provided with a plastic coating. When resilient means is provided for holding the cover on the container top edge, it may be an outer frame with a sealable lip resiliently securable on the container top edge by coil springs each fastened to outwardly extending ears on two opposite sides of the cover frame, linked chains depending from the coil springs, and a bifurcated boss extending from the container sides cooperates with the links of the chain. An inner cover hinged along one inner edge of the frame rests on an inwardly extending ledge on the bottom of the frame, and coil springs extend between ears on the bottom of the inner cover and on the bottom of the hinged side of the frame, with sealing material between the inner cover and the supporting ledge.

3,618,815
EASY-OPENING DEVICE FOR A CONTAINER END
Robert E. Heffner, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed May 4, 1970, Ser. No. 34,131
Int. Cl. B65d 17/00
U.S. Cl. 220—48 6 Claims



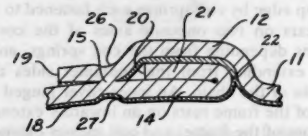
This disclosure relates to an easy-opening container end in which the opening device remains attached to the end after opening, and which includes a V-shaped opening flap in the container end which is forced or plunged into the container by means of a lever tab which has a line of weakness in its upper surface between its handle end and its nose end so that upon opening, the handle end of the tab may be depressed to a nonobstructing position on the container end without closing the pouring orifice in the end.

3,618,816
TAB FOR EASY-OPENING CONTAINER WALL
Omar L. Brown, Dayton, Ohio, assignor to Dayton Reliable Tool & Mfg. Company, Dayton, Ohio
Filed Apr. 22, 1970, Ser. No. 30,649
Int. Cl. B65d 17/24
U.S. Cl. 220—54 17 Claims



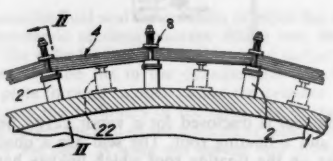
A tab including a lever portion and a handle portion integrally connected to one end of the lever portion by a pliable portion. The other end of the lever portion is suitably connected to a tear portion of a container wall. In use, the handle portion is raised as permitted by the pliable portion until the handle portion is at an appropriate angle to exert a lifting force on the lever portion. Then an outward pulling force is applied to the handle portion to initiate severance of the tear portion with the lever action of the lever portion.

3,618,817
FOOD CONTAINER AND METHOD OF MAKING THE SAME
Thomas D. Troughton, Richmond, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.
Filed May 14, 1970, Ser. No. 37,107
Int. Cl. B65d 25/14
U.S. Cl. 220—64 7 Claims



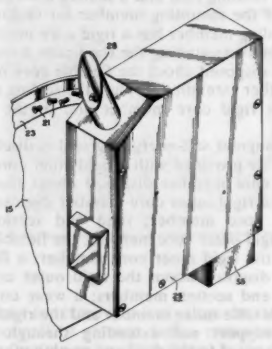
A shell or body tube for a relatively large container such as a tin-lined pail adapted for use in storing and shipping food products and the like, and a method of making such body tube. The method utilizes as the starting material a flat metal sheet plated along at least one side thereof with a layer of tin, and the sheet has longitudinal edge portions respectively terminating in unfinished edges. The plated sheet is bent upon itself along one longitudinal edge portion thereof to form a generally U-shaped section having the tin plating therealong facing outwardly; and the sheet is then formed into a tube having the longitudinal edge portions thereof overlapped and seam welded to each other in close proximity with the unfinished edge of the U-shaped section but on the side thereof at which there are only two juxtaposed layers of the metal sheet. The seam weld and temperature developed therefor are controlled so that the heat of fusion dissipating transversely through the body tube from the situs of the weld fuses the contiguous layers of tin plating along the U-shaped section, thereby isolating both of the unfinished longitudinal edges of the body tube from the interior thereof.

3,618,818
PRESSURE-RESISTANT ENCLOSURE
Andre Puyo, Paris; Jack Picaut, Paris, and Robert Saglio, Antony, all of France, assignors to Coyne et Bellier, Bureau D'Ingenieurs-Conseils, Paris, France
Filed Nov. 21, 1969, Ser. No. 878,769
Claims priority, application France, Nov. 28, 1968, 175684
Int. Cl. B65d 7/44
U.S. Cl. 220—71 10 Claims



A generally cylindrical vessel subject to internal pressure is surrounded by one or more hoops each consisting of at least one winding of a flat strip bearing upon a multiplicity of peripherally spaced webs under the pressure of spring-loaded clamping plates mounted on these webs.

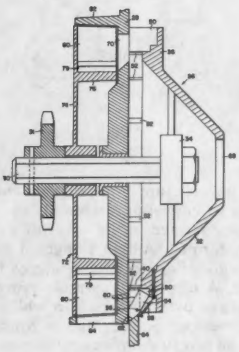
3,618,819
ELECTRONIC COUNTING APPARATUS
Charles M. Blackburn, Seat Pleasant, and John L. Ditman, Beltsville, both of Md., assignors to Sigma Systems Incorporated, Seat Pleasant, Md.
Filed Oct. 7, 1969, Ser. No. 864,426
Int. Cl. G07f 11/00
U.S. Cl. 221—2 12 Claims



A supply unit comprising a source of parts or pieces feeds a parts-handling unit, which in cooperation with an elec-

tronic controller unit, exactly accumulates batches or lots of a predetermined number of parts. The batches are dumped into packages or bags and the counter is reset prior to the next accumulation. High speed and accurate counting are obtained by detecting parts passing to the accumulator through interruption of a broad thin area beam of light impinging on a solar cell via limit slits. The length of each output pulse is analyzed to determine if one or two parts passed and the counter is appropriately updated. Also, the feeding rate is reduced when the count approaches the predetermined number comprising a batch, and a high speed deflector moves into the parts path to the accumulator as the batch is completed to the predetermined number to deflect following parts away from the accumulator for subsequent refeeding to the parts-handling unit.

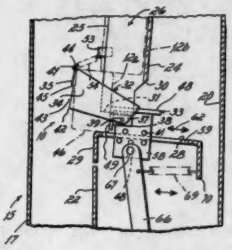
3,618,820
SEED-SELECTING MECHANISM
Eugene Gilson Keeton, Rte. 2, Trenton, Ky.
Filed Jan. 13, 1970, Ser. No. 2,568
Int. Cl. A01c *9/00*
U.S. Cl. 221—219 **5 Claims**



A planter provided with a seed-selecting mechanism including a housing rotatable about a horizontal axis and having one end abutting against and cooperating with a fixed plate to form an annular groove having a rotatable bottom. The rotatable grooved bottom has notches circumferentially spaced along its inner side for receiving and elevating a plurality of seeds from a seed supply in the bottom of the housing. Fingers extend radially from the outside to the inside of the housing and are pivotally connected thereto for movement in the notches toward and away from the fixed plate and the fingers are biased to a position wherein they extend closely adjacent the fixed plate. A cam moves the fingers away from the fixed plate as the notches pass through the seed supply and as the notches move upwardly from the seed supply, the fingers are successively disengaged from the cam and pivot to pin a seed against the fixed plate. A discharge opening in the fixed plate is in the path of the rotating fingers and the fingers eject the pinned seeds therethrough.

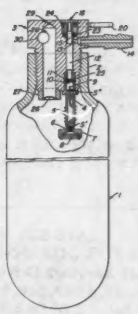
3,618,821
DISPENSING MECHANISM FOR A VENDING MACHINE
Charles J. Laug, Cincinnati, Ohio, and Charlie F. Jones, Covington, Ky., assignors to William F. Shepherd Inc., Cincinnati, Ohio
Filed May 7, 1970, Ser. No. 35,399
Int. Cl. B65h *3/24*
U.S. Cl. 221—247 **4 Claims**

A dispensing mechanism for a coin-operated vending machine of that type having at least one substantially vertical chamber adapted to hold a plurality of cookie packages in stacked relation, one on top of the other. A fixed horizontal ledge is positioned beneath the stack of packages to provide a bottom supporting surface. An ejector cage is positioned at the bottom of the stack and is adapted to reciprocate horizontally between a home position whereat the bottommost package of the stack is embraced by the cage and an eject position whereat the cage (with the bottommost



package) is pushed from beneath the stack and over the fixed horizontal ledge for dispensing the cookie package.

3,618,822
EMERGENCY OXYGEN SUPPLY DEVICE
August J. Hildenbrandt, Jr., Fairfield, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed June 5, 1969, Ser. No. 830,722
Int. Cl. B67b *7/00*
U.S. Cl. 222—3 **3 Claims**

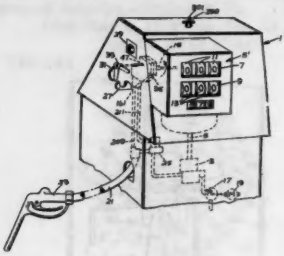


A gas supply unit (such as for the supply of emergency oxygen) with such unit comprising a high-pressure gas cylinder having a gas release section that provides laminar flow through a capillary tubing section so as to obviate the need of moving parts in the gas flow regulation from the interior of the cylinder to a gas outlet nozzle. A preferred embodiment uses a pull pin, together with a movable rod and rupture disc means, that are all downstream from the capillary tubing as the actuator mea o initiate flow from the high-pressure cylinder.

3,618,823
FUEL DISPENSER POWER RESETTING AND CONTROL MECHANISM
Christian W. Kruckeberg, Fort Wayne, Ind., assignor to Tokheim Corporation
Filed May 18, 1970, Ser. No. 38,063
Int. Cl. B67d *5/26*
U.S. Cl. 222—33 **21 Claims**

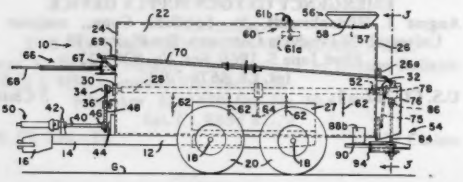
A power-operated mechanism which operates the register resetting and flow control devices of a liquid fuel dispenser in sequence, in response to the proper operation of a single-

manual control lever, and which, with minor added control mechanism, compels predetermined manual operation of



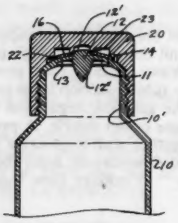
self-service, ticket printing, or other optional attachments for the dispenser.

3,618,824
MATERIAL SPREADER
Shaun A. Seymour, Ephrata, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Aug. 30, 1968, Ser. No. 756,478
Int. Cl. A01c *3/06*
U.S. Cl. 222—51 **7 Claims**



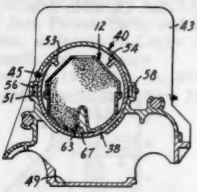
A material spreader comprised of a tank, mounted on a wheeled frame and adapted to contain liquid manure, an inlet port to fill the tank, and outlet to discharge slurry material from the tank, agitator means within the tank to keep solids in suspension, and adjustably positionable distributing means adjacent the outlet adaptable to distribute the slurry on the ground in a uniform pattern of preselected direction.

3,618,825
CLOSURE FOR DISPENSING SPOUT
Robert E. Clarke, 1410 Saratoga Drive, Bel Air, Md.
Filed Dec. 15, 1969, Ser. No. 885,021
Int. Cl. B05b *1/34*
U.S. Cl. 222—106 **1 Claim**



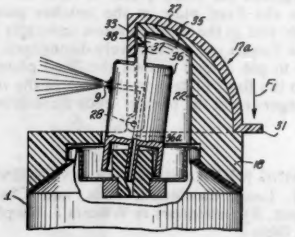
A closure for dispensing spout, especially adapted for use with liquids or semiliquids, the spout having a central passage, a member spanning the passage and having a central closed portion and open areas between the central closed portion and the outer periphery thereof, and a resilient membrane or diaphragm member having a central opening overlying the central closed portion of the spanning member, the diaphragm extending outwardly from the central closed portion to the outer periphery of the spanning member and normally closing the open areas of the spanning member, the outer periphery of the diaphragm member being sealed to the spout and the inner portion thereof surrounding the opening being deflectable outwardly by pressure on the material in the spout to allow discharge of the material through the open areas of the spanning member and around the central closed portion, the resilience of the diaphragm closing the open areas of the spanning member when no pressure is exerted on the material in the spout.

3,618,826
DEVELOPER POWDER SUPPLY
Larry G. Kangas, St. Joseph Township, St. Croix County, Wis., and Robert W. Carlson, Bloomington, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 20, 1969, Ser. No. 867,693
Int. Cl. B65d *47/00, 83/06*
U.S. Cl. 222—166 **8 Claims**



A developer powder supply package in which a removable strip is secured to converging sidewalls to cover a powder discharge opening formed in the cover of a container which also has a body formed with an elongated recess for mating with a dispensing carriage extending across the exterior surface of its base. A dispensing carriage provides support for the supply package over an area into which it is desired to dispense the developer powder and is rotatable to support the package in an inverted position to dispense the developer powder from the container through the discharge opening after the strip has been removed.

3,618,827
SPHERICAL, SWINGING CLOSURE/ACTUATOR CAP FOR AEROSOL CANS
Mario Melocchi, Via Mose Bianchi 71, Milan, Italy
Division of Ser. No. 630,760, Apr. 13, 1967, Pat. No. 3,469,746. Filed July 17, 1969, Ser. No. 842,678
Int. Cl. B65d *83/14*
U.S. Cl. 222—182 **4 Claims**



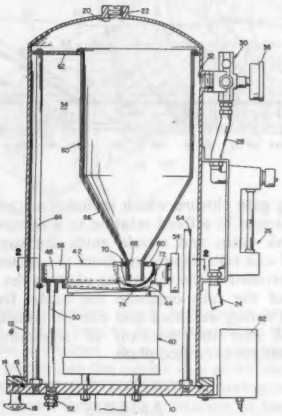
This invention relates to a part-spherical cap for an aerosol container which cap is mounted to rotate about a pivotal axis and thereby actuate the control valve of the container. This cover is so designed that movement in one direction, both uncovers the container nozzle and actuates the control valve, while movement in the other direction automatically results in closure of both valve and cover.

3,618,828

POWDER FEEDER

Albert A. Schinella, Concord, N.H., assignor to Humphreys Corporation, Bow, N.H.

Filed June 8, 1970, Ser. No. 44,007
Int. Cl. B67d 5/54
U.S. Cl. 222—193 10 Claims



A powder feeder includes a feeding structure having a receiving surface, a feeding surface and a discharge channel. A drive vibrates the feeding surface to move particles along that surface from the receiving surface to the discharge channel. A supply hopper has an outlet channel above and spaced from the receiving surface and disposed between the outlet channel of the supply hopper and the receiving surface of the feeder structure is a control member that has a port aligned with and of smaller dimension than the outlet channel of the supply hopper.

3,618,829

EXPANDABLE RECEPTACLE

Austin E. Elmore, 8519 E. Pasadena Ave., Scottsdale, Ariz., and Ernest A. Uhlmann, 5205 N. Saddle Rock Road, Phoenix, Ariz.

Filed Oct. 14, 1968, Ser. No. 767,340
Int. Cl. B65d 37/00
U.S. Cl. 222—209 2 Claims

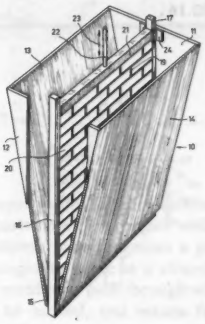
A receptacle having accordion folding in the top portion which functions both as a means to allow compression and expansion of the receptacle from variations of ambient temperature and atmospheric pressure and for evacuating the contents of the receptacle through a discharge nozzle at the top of the accordion folding.

3,618,830

DEVICE FOR ACCURATELY DOSING A CONTINUOUS FLOW OF FINE-GRANULAR POWDER

Peter Theodorus Joseph Bex, and Willem Luiten, Emmasingel, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1969, Ser. No. 873,884
Claims priority, application Netherlands, Nov. 13, 1968, 6,816,124
Int. Cl. G01f 11/10
U.S. Cl. 222—361 5 Claims



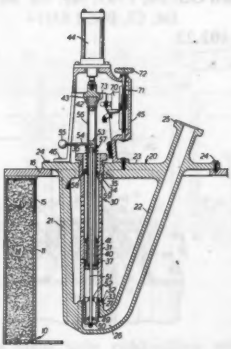
A device for accurately dosing at a previously adjustable value a continuous flow of fine-granular powder having a particle size of smaller than approximately 20 microns out of an outlet aperture of a storage container. The container is provided with a sheathlike thin-walled member which is open on its lower side and vibrates approximately parallel to the direction of flow of the powder. The wall of the member is substantially gridlike and the open end of the member is arranged with a small amount of play in the outlet aperture of the container.

3,618,831

CASTING MACHINES FOR CASTING BATTERY PLATE GRIDS

Alan John Goodwin, and Norman Shanks, both of Swinton, England, assignors to Chloride Overseas Limited, Swinton, England

Filed June 20, 1969, Ser. No. 834,963
Claims priority, application Great Britain, June 21, 1968, 29,680/68
Int. Cl. B67d 5/50
U.S. Cl. 222—385 2 Claims



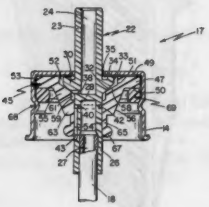
For supplying molten lead to a battery plate grid casting machine, a lead pump, immersed in molten lead in a lead

pot, is formed as a readily removable cartridge incorporating all the working parts of the pump, which is simply screwed into a fixed body incorporating the delivery pipe.

3,618,832
FAST FILL VALVE ASSEMBLY FOR PRESSURIZED DISPENSING PACKAGE

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 14, 1969, Ser. No. 799,448
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.16 **17 Claims**

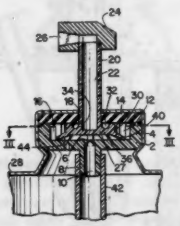


A valve assembly for a pressurized dispensing package in which a rigid elongated valve member having upper and lower passages separated by a transverse wall member, upper and lower ports communicating with these passages, respectively, and a first camming surface, acts upon a flexible sealing member having a passage for receiving the valve member, a flange for securing it to the package, a skirt portion sealing the lower valve port, and a second inclined camming surface between the skirt and the flange which cooperates with the first camming surface, in such a way as to separate the sealing surface of the skirt from the lower port, opening communication between the ports to permit material flow from the container, through the valve passages, to atmosphere. The camming surfaces are operated by applying either a tilting or an axial pressure to the valve member; the described valve assembly is also self-returning, and may be charged in a manner bypassing at least one valve port.

3,618,833
AEROSOL DISPENSER VALVE

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 20, 1969, Ser. No. 867,641
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.22 **6 Claims**

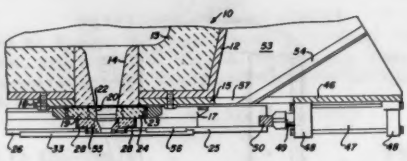


An aerosol dispenser valve including a spring-biased valve member having a spring-biasing means integral therewith.

3,618,834
SLIDING GATE CLOSURE FOR BOTTOM-POUR VESSEL REMOVABLE AS A UNIT

Earl P. Shapland, Jr., Champaign, Ill., and James T. Shapland, Wilkens Township, Allegheny County, Pa., assignors to United States Steel Corporation

Filed May 26, 1969, Ser. No. 827,605
Int. Cl. B67d *3/00*
U.S. Cl. 222—504 **7 Claims**

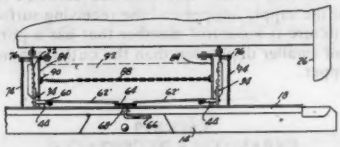


A sliding gate closure which includes a replaceable orifice plate positioned in a fixed relation to a removable mounting plate. Blank gates and nozzle gates are supported on entrance and exit rails depending from the mounting plate, and on levers pivoted to the mounting plate in the space between the ends of the rails opposite the outlet from the vessel. Levers are spring actuated and can be adjusted individually beforehand and the position of adjustment maintained through changes of orifice plate.

3,618,835
TRUCK BUMPER, TRAILER HITCH AND QUICK ACCESS TIRE CARRIER

Edwin C. Terry, and Robert C. Terry, both of Ursa, Ill.

Filed July 18, 1969, Ser. No. 843,048
Int. Cl. B62d *43/00*; B61f *19/04*
U.S. Cl. 224—42.06 **8 Claims**



A bumper for a vehicle adapted to have a trailer hitch device connected thereto and said bumper being swingable from a vertical plane to a horizontal plane to permit a vehicle to back up to a dock and to permit easy access to a tire carrier, the structure including bracket means connected to the chassis of the vehicle, other bracket means pivotally connected to said first-mentioned bracket means with bumper means rigidly secured to said other bracket means, and latch means operatively connected to linkage means secured to the bumper for latching the bumper in a vertical plane to said first mentioned bracket means at one time and for releasing said bumper so it can be swung to a horizontal lower plane at another time, said bumper means being positioned in a plane below a tire carrier bracket when in its lower position to provide quick access to a tire adapted to be carried by said tire carrier.

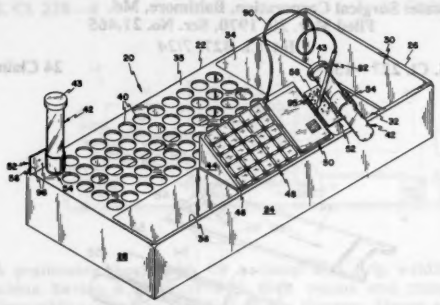
3,618,836
CHEMISTRY ENCODING

Dwight J. Bushnell, Murray, and Max Glen Worthington, Salt Lake City, both of Utah, assignors to Bio-Logic, Inc., Salt Lake City, Utah

Filed Sept. 15, 1969, Ser. No. 857,978
Int. Cl. G06k *1/12, 5/02, 19/00*
U.S. Cl. 225—1 **8 Claims**

Method and apparatus for encoding chemistry information on an identification device used to identify containers of biological matter such as blood samples, the apparatus including superimposed dies each having a plurality of rows of

apertures, the apertures of one die being in alignment with the apertures of the other die, the dies being spaced one from another to receive the identification device between the dies. A stylus, having a tip for penetrating the identification device, is selectively inserted through the aligned apertures in the two dies thereby perforating (encoding) the device at one



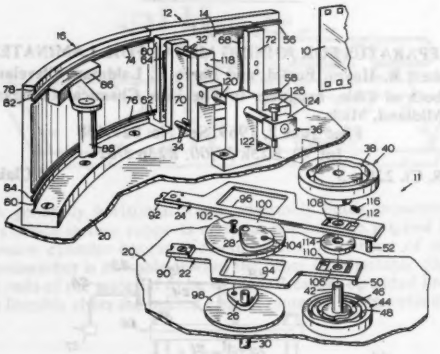
or more predetermined sites. Each perforation represents a chemical test or a set of tests to be performed on the biological matter in the container. A verifier is provided so that when the stylus perforates the device at a given site, an electrical circuit is completed to illuminate a corresponding portion of a display panel for optical indication to the operator of the true nature of the encoding which has taken place.

3,618,837

FILM TRANSPORT MECHANISM

Jan W. Jacobsen, Copenhagen, Denmark, assignor to Multiscreen Corporation Limited

Filed Dec. 29, 1969, Ser. No. 888,997
Int. Cl. G03b *1/22*
U.S. Cl. 226—57 **13 Claims**



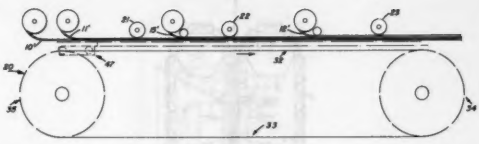
A film transport mechanism for moving a film through a motion picture camera or the like. The mechanism has a pair of claw arms pivotally and slidably mounted on a common axis. The arms are respectively driven in an arc about the axis by constant diameter cams which rotate at constant speed and move the claw arms back and forth through half a film frame length. Each claw arm has a claw at its distal end for engaging film perforations. The cams are attached to a common shaft and they impart motion to the arms such that the arms never move in the same direction. A cam wheel rotates about the axis and combines with followers attached to the arms to reciprocate the claws into and out of engagement with the film at predetermined points in a cycle, the predetermined points being fixed in relation to the angular positions of the cams relative to an arbitrary datum.

3,618,838

VACUUM TRUCK SYSTEM

Stanley R. Schieven, Webster, and Gerald A. Sampson, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,324
Int. Cl. B65h *17/28*
U.S. Cl. 226—95 **10 Claims**



An endless conveyor mechanism for holding one or more webs and/or other parts on a rigid surface while they are conveyed along a rectilinear path comprises a plurality of rigid truck members arranged to move in a closed path one portion of which is the rectilinear path through which the web or other parts are to be moved, and means for moving said trucks so that during the time they are moving in said trucks so that during the time they are moving in said rectilinear path they are held in abutment so that their web-supporting surfaces combine to form, in effect, a single rigid surface on which the web or other parts are held by vacuum as they are moved through said path.

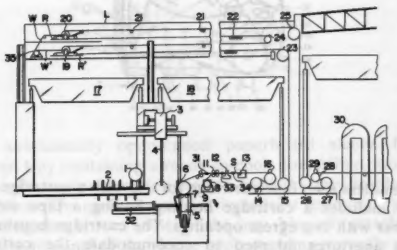
The driving mechanism for the truck members brings the trucks into tight abutment at the beginning of the rectilinear path, then advances said trucks in butted relation through said path at a controlled rate, while at the same time accommodating for slight tolerances in individual truck dimensions, and then controls the movement of the trucks into the return portion of their path in such a way as to prevent them from bumping together and becoming damaged.

3,618,839

CONTINUOUS STEEL STRIP COLD-ROLLING MILL APPARATUS

Yoshiaki Kawasoko, Fukuyama-shi, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Japan

Filed Dec. 8, 1969, Ser. No. 882,824
Claims priority, application Japan, Jan. 8, 1969, 44/1444
Int. Cl. B65h *17/42*
U.S. Cl. 226—118 **2 Claims**

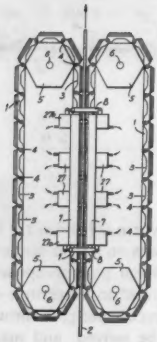


In a continuous steel strip cold-rolling mill apparatus wherein steel strips are welded together into a long continuous strip, stored in a looper and then cold rolled by a tandem mill, said looper is installed horizontally in a space of a factory building above overhead travelling cranes thereof.

3,618,840
ENDLESS TRACK DEVICES FOR LAYING CABLES AND THE LIKE

Bernard Francois Maurice Courret, Toulon, France, assignor to Etat Francais Delegation Ministerielle pour L'Armenent, Paris, France

Filed Dec. 30, 1969, Ser. No. 889,139
Claims priority, application France, Dec. 31, 1968, 182.800
Int. Cl. B65h *17/34*
U.S. Cl. 226—172 11 Claims

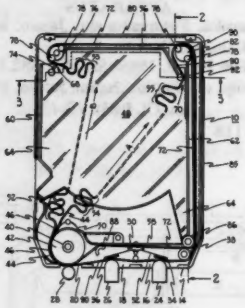


A pair of opposed endless track devices have adjacent branches whose links cooperatively engage a cable therebetween and advance the cable with the links. The links travel in rails and form chambers therewith in which pressure fluid is supplied to force the links into engagement with the cable while advancing the links and cable therewith.

3,618,841
ENDLESS LOOP TAPE CARTRIDGE

Robert Daniel Browning, Indianapolis, Ind., assignor to RCA Corporation

Filed Oct. 1, 1969, Ser. No. 862,682
Int. Cl. B65h *23/10*
U.S. Cl. 226—195 9 Claims

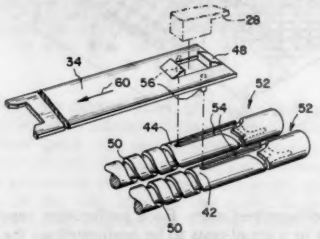


An endless loop tape cartridge for use with a cartridge tape player includes a cartridge housing having a tape storage chamber with two egress openings. The cartridge housing includes apertures adapted to accommodate the cartridge player transducers, and additionally, a rotatably mounted pressure roller. The endless loop of magnetic tape is positioned within the cartridge such that the tape loop path moves: (a) around the pressure roller, (b) into the cartridge storage chamber, (c) out through the cartridge chamber first egress opening, (d) across the front end of the cartridge for engagement with the player transducers, (e) around the pressure roller, (f) reinserted into the cartridge storage chamber, and (g) out through the cartridge chamber second egress opening back to the pressure roller.

3,618,842
SURGICAL STAPLING CARTRIDGE WITH CYLINDRICAL DRIVING CAMS

Graham W. Bryan, Ridgefield, Conn., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Mar. 20, 1970, Ser. No. 21,465
Int. Cl. B27f *7/24*
U.S. Cl. 227—138 24 Claims

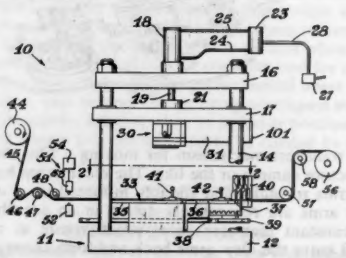


A sterilized disposable cartridge for a surgical instrument adapted to apply staples to the disunited skin or fascia of a patient in order to effect the joining of the tissue. A number of staples are housed in the staple-carrying cartridge and are supported and driven by means of a pair of threaded screws. The rear portion of each screw is provided with a cylindrical camming surface; and each screw is caused to rotate in response to the interaction between a driving member and its cylindrical camming surface. The associated surgical instrument is powered by a gas under pressure and employs a power unit having O-ring seals.

3,618,843
APPARATUS FOR JOINING METAL FOIL LAMINATES

Robert R. Hayes, Euclid, and Barry L. Laidman, Cleveland, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed June 2, 1969, Ser. No. 829,438
Int. Cl. B23k *21/00*; B23p *3/02*
U.S. Cl. 228—3 12 Claims



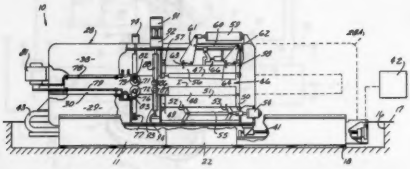
An apparatus is described suitable for the cold welding of metal foil or plastic-metal laminates such as aluminum-polyethylene wherein electrical contact is obtained by forming a weld through at least one layer of plastic of the laminate.

3,618,844

STRIP POSITIONING DEVICE

John D. Morley, Bay City, and William F. Salbenblatt, Saginaw, both of Mich., assignors to Newcor, Inc., Bay City, Mich.

Division of Ser. No. 563,971, May 31, 1966, Pat. No. 3,511,961. Filed Oct. 24, 1968, Ser. No. 790,185
Int. Cl. B23k *1/00, 37/04*
U.S. Cl. 228—4 14 Claims



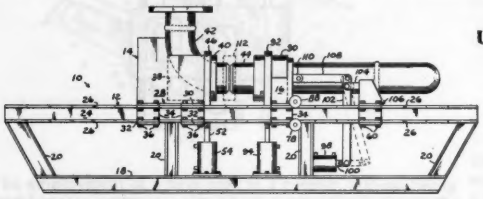
A positioning mechanism for a clamp in a strip welding machine having a platform with slide means and means reciprocably supporting the slide means thereon. Means are provided for reciprocating the slide means and the slide means has at least one contact surface thereon arranged at an acute angle to the path of the slide means. A carriage is provided for supporting the clamp and guide means are provided on the platform for supporting the carriage for movement transversely of the slide means. At least one contact surface, fixed with respect to the carriage is provided and is slideably engaged with the contact surface on the slide means for causing the carriage to reciprocate along the guide means in response to reciprocation of the slide means.

3,618,845

PRESSURE WELDING APPARATUS

Luther D. Totten, 619 Spring, Mount Shasta, Calif.

Filed Apr. 24, 1969, Ser. No. 818,864
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 6 Claims



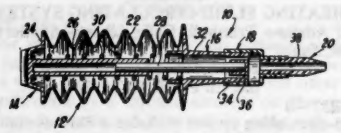
A generally horizontal frame adjustably holds crossmembers which in turn supports material holding dies gripped by pressure cylinder operated clamp means. A portion of one crossmember is movable toward the other to adjustably align the ends of the material to be welded. Pressure operated linkage forcibly abuts the heated ends of material being welded.

3,618,846

MANUALLY OPERATED SUCTION DEVICE

Patrick J. Poli, 39 Pine St., Plainview, N.Y.

Filed Feb. 17, 1969, Ser. No. 799,766
Int. Cl. B23k *3/06*
U.S. Cl. 228—52 3 Claims



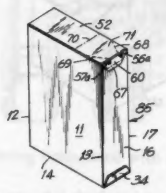
A cold tip manually operated suction device having a removable trap for the disposing of collected excess solder.

3,618,847

RECLOSABLE DISPENSING CONTAINER WITH SNAP-LOCKING TOP TAB

Stanley R. Koolnis, New York, N.Y., assignor to Lee Drechsler, Palisades and Fred Zandell, New York, N.Y.

Filed July 30, 1969, Ser. No. 846,039
Int. Cl. B65d *5/54*
U.S. Cl. 229—17 R 12 Claims



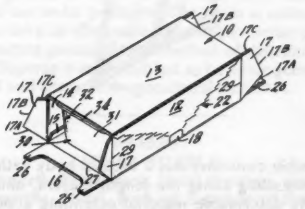
The present invention pertains, generally, to reclosable containers and, more particularly, to reclosable containers having a top wall comprising inner and outer panels adhesively secured at selective locations, a pair of spaced retainers projecting from said top wall and a tab extending from a panel of said top wall, enabling the container to be reclosed after initial opening by the positioning of said tab between said pair of spaced retainers.

3,618,848

PAPERBOARD SLEEVE FOR TRAYS

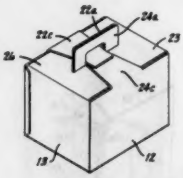
Thomas Dominic Pawlowski, Neenah, and Richard Gene Mathison, Larsen, both of Wis., assignors to American Can Company, New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,390
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 R 5 Claims



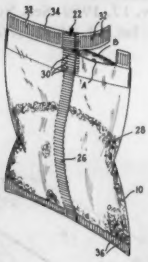
A substantially open-ended paperboard sleeve for a tapered tray containing a ready-to-cook comestible, having a new end construction designed to hold the tray in place in the sleeve. The end construction includes a restraining panel, biased against an end panel of the tray, hingedly attached to the bottom panel of the sleeve and extending inwardly of the sleeve. The end construction also includes two locking panels hingedly connected to the side panels of the sleeve and extending inwardly of the sleeve. The restraining panel is provided with a pair of fingers, extending inwardly of the sleeve and in cradling relationship to the end panel of the tray. Each locking panel overlies a respective finger thereby preventing the restraining panel from moving outwardly of the sleeve and away from the tray.

3,618,849
CONTAINER HANDLE AND TOP CLOSURE
Jon M. Schwaner, and Lloyd W. Ellson, both of Indianapolis, Ind., assignors to Inland Container Corporation, Indianapolis, Ind.
Filed June 18, 1970, Ser. No. 47,194
Int. Cl. B65d 5/46
U.S. Cl. 229—52 B 4 Claims



Disclosed is a container in which tabs are cut from the opposing, first-closed, or inner closure flaps, the tabs extending to the hinged margin of the closure flaps. The free end portions of the inner closure flaps have upturned registering marginal portions forming a carrying handle, the overlying outer closure flaps having slots accommodating the handle portions of the inner flaps and the tabs extending in overlying relation to the outer closure flaps and into locking engagement with said handle portions.

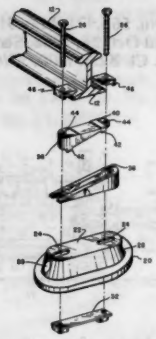
3,618,850
RECLOSEABLE CONTAINER
Charles E. Palmer, Main St., Somers, Conn.
Filed Apr. 13, 1970, Ser. No. 27,835
Int. Cl. B65d 33/30
U.S. Cl. 229—62 9 Claims



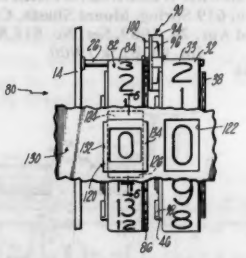
A recloseable container has a tubular body with a longitudinal flap extending along the length thereof, and a strip of nonresiliently deformable material extending about its inner periphery. The longitudinal flap is secured to the body, and the body is deformed by pleats extending through the secured area and generally parallel to the strip of deformable material to provide a tear channel. The strip of deformable material is capable of maintaining a folded configuration to render the container recloseable by folding it along the strip to engage opposed portions thereof.

3,618,851
ADJUSTABLE RAIL FASTENER
Webster D. Smith, Lomita, and William I. Berks, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Feb. 19, 1970, Ser. No. 12,777
Int. Cl. E01b 9/42, 9/66
U.S. Cl. 238—281 5 Claims

A pair of wedgelike elements are mounted one above the other between a horizontal surface and a rail, with their inclined surfaces abutting each other. One of the wedgelike elements is moved laterally to raise or lower the rail, whereas both elements are moved laterally to cause the rail to move sideways.



3,618,852
FUEL PUMP REGISTER WITH EXPANDED READOUT
William Kes, Avon, and Lawrence E. Hough, Hartford, both of Conn., assignors to Veeder Industries Inc., Hartford, Conn.
Filed Nov. 10, 1969, Ser. No. 875,410
Int. Cl. G06c 15/42; B67d 5/22
U.S. Cl. 235—94 R 7 Claims

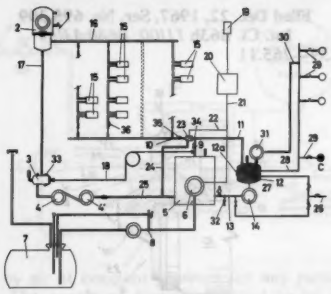


Register conversion means for modifying the volume and/or cost counters of a fuel pump register for expanding the available readout of the volume counter from 99 9/10 gallons to 149 9/10 gallons and the available readout of the cost counter from $9.99 to $14.99 and which comprises a substitute highest order number wheel bearing the sequence of indicia of 0–14 and having a 30-tooth drive gear, a substitute compound transfer gear with relatively large and small eight-tooth gears respectively engageable with the drive gear of the substitute number wheel and the combination locking ring and two-tooth transfer segment of the adjacent lower order number wheel for indexing the substitute wheel one count for each revolution of the adjacent lower order number wheel, and an auxiliary window mask for the substitute wheel.

3,618,853
HEATING FLUID CIRCULATING SYSTEM
Antonino Adriano Trimboli, Calle Alberto Aquilera No. 32, Madrid, Spain
Filed Feb. 27, 1969, Ser. No. 804,053
Int. Cl. F24d 3/02, 3/08
U.S. Cl. 237—8 13 Claims

A fluid-circulating system includes a fluid-containing heating circuit and a discrete hot water circuit. Each circuit has a portion adjacent to the other. One or more radiators are provided in the heating circuit, and a boiler is similarly provided

in the heating circuit. Circulators are provided in both circuits for circulating the fluids therein. A heat exchanger is associated with the adjacent portions of both circuits and effects heat exchange between the fluids in these adjacent portions whereby the fluid in the hot water circuit is indirectly heated by the boiler of the heating circuit.

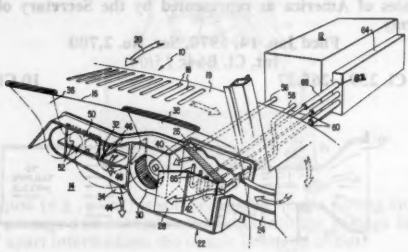


3,618,854

VEHICLE-HEATING SYSTEM EMPLOYING A CRITICAL POINT HEAT PIPE

Sidney Frank, Baltimore, Md., assignor to Isotopes, Inc., Westwood, N.J.

Filed Dec. 23, 1968, Ser. No. 786,053
Int. Cl. B60h *1/08*
U.S. Cl. 237—12.3 B **9 Claims**



The employment of a heat pipe as a passive, self-operating thermal energy transport valve which automatically thermally couples a heat source to a heat sink or decouples the same depending upon the operating temperature of the heat pipe and its relation to the critical point of the working fluid. The critical point heat pipe can serve as an auxiliary heat transport device for supplying heat from the exhaust gases of a vehicle engine to the vehicle compartment heat exchanger during engine warmup.

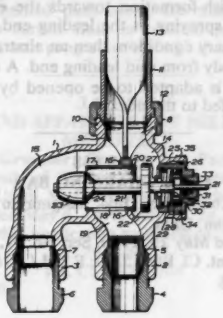
3,618,855

RADIATOR VALVES

Sven David Ferdinand Nilsson, and Kurt Rune Glimmerfors, both of Markaryd, Sweden, assignors to Aktiebolaget Markaryds Metallarmatur, Markaryd, Sweden

Filed Oct. 15, 1969, Ser. No. 866,464
Claims priority, application Sweden, Oct. 22, 1968, 14,243/68
Int. Cl. F24d *3/00*
U.S. Cl. 237—59 **4 Claims**

A radiator valve has a housing with a displaceable valve stem in a passage, one end of which has a valve seat controlled by a valve member on the stem and the other end of which is controlled by a throttle element on the stem and which passage is connected between its ends with an inlet connection for hot water supply for dividing the inlet flow of hot water in one stream passing past the valve member to a feed outlet connected to the radiator inlet, and one stream passing past the throttle element to a return chamber and to an outlet pipe connection while bypassing the radiator, the return chamber being connected with a return inlet from the radiator.



ERRATUM

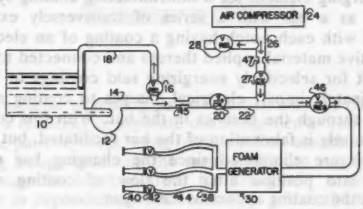
For Class 238—281 see:
Patent No. 3,618,851

3,618,856

METHOD AND MEANS FOR DISPERSING FOAM

Norman H. Sachnik, San Angelo, Tex., assignor to Range Engineering Development Corporation, San Angelo, Tex.

Filed Apr. 28, 1967, Ser. No. 634,551
Int. Cl. A01n *17/02*; **A62c** *1/12*
U.S. Cl. 239—8 **3 Claims**



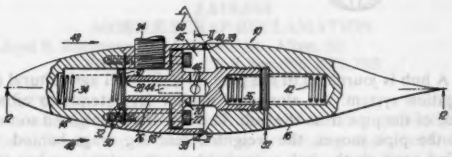
Foam is generated by mixing water, foam material, and compressed air under pressure. The foam is released from a nozzle by a valve at the nozzle, resulting in better control and a more constant product. One method of distribution of the foam is to disperse it in an airblast to be subsequently carried by the wind and spread for agricultural purposes.

3,618,857

SPRAY NOZZLE

Johannes Hendrik Rautenbach, Natal Province, and Maitland Reed, Westville, Natal, both of Republic of South Africa, assignors to Aviation Design & Engineering Company, South Africa (Proprietary) Limited

Filed Apr. 30, 1969, Ser. No. 820,544
Claims priority, application Republic of South Africa, May 8, 1968, 68/2980
Int. Cl. B05b *1/06*
U.S. Cl. 239—11 **4 Claims**



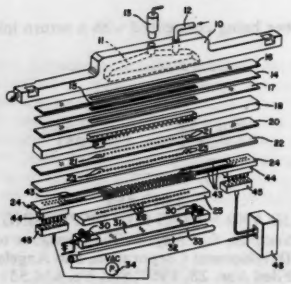
A spray nozzle the body of which is provided with a circumferential spray orifice. The orifice is defined by faces on

two pieces which are adjustable relatively to one another so that the width of the orifice can be varied. The body is formed by rotating an aerofoil section about a chord of the section and the orifice is positioned so that spray fluid is directed in a dish-formation towards the end of the body which, in aerial spraying, is the leading end. If the nozzle is used in a stationary condition, then an airstream is caused to flow over the body from said leading end. A one-way valve is provided which is adapted to be opened by the pressure of the spray liquid fed to the nozzle.

3,618,858
DROP CHARGING BAR

Fred E. Culp, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 25, 1970, Ser. No. 41,126
Int. Cl. B05b *5/00;* **F 23d** *11/28*
U.S. Cl. 239—15 **4 Claims**

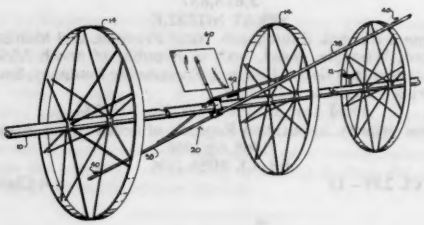


A charging element for a noncontacting coating system is formed as a bar with a series of transversely extending notches with each notch having a coating of an electrically conductive material applied thereto and connected to a control unit for selectively energizing said coatings to thereby discriminately impart electrical charges to coating material passing through the notches in the bar. With this construction not only is fabrication of the bar facilitated, but startup problems are eliminated since the charging bar may be moved into position after the flow of coating material through the coating apparatus has begun.

3,618,859
WIND ANCHOR FOR IRRIGATION PIPE

Victor D. Watts, 1310 E. Buckley, Brownfield, Tex.

Filed Sept. 23, 1970, Ser. No. 74,676
Int. Cl. A01g *25/02*
U.S. Cl. 239—212 **9 Claims**

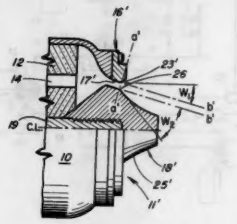


A hub is journaled to the pipe on a side-roll agricultural irrigation system. An elongated anchor let extends to either side of the pipe from the hub. The rear leg is weighted so that as the pipe moves, the weighted rear leg drags behind. A wind vane on the hub extends above the pipe so when the wind moves the wind vane, the leeward leg is moved into anchoring position.

3,618,860
ROCKET ENGINE NOZZLE

Arthur R. Parilla, Mountain Lakes, N.J., and Howard D. Thompson, West Lafayette, Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 22, 1967, Ser. No. 695,309
Int. Cl. B63h *11/00;* **B64d** *33/04*
U.S. Cl. 239—265.11 **6 Claims**

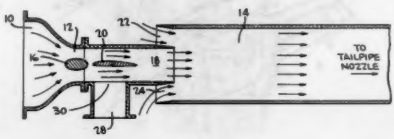


A plug nozzle for rocket engines wherein the danger of nozzle failure due to particle impingement on the plug surface when metallized solid propellants are utilized is eliminated without effecting desirable design characteristics by the provision of a double corner for Prandtl-Meyer expansion, the angle at the cowl lip corner being reduced and supplemented by a second corner formed in the plug itself at the throat section of the nozzle.

3,618,861
DIVERTER VALVE FLOW THROTTLE

Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 14, 1970, Ser. No. 2,700
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.27 **10 Claims**



A diverter valve flow throttle for controlling the flow of the high-velocity exhaust gases of a turbojet engine in V/STOL aircraft. In a first embodiment, the diversion is performed by a single rotating vane that blocks the flow of gases only in the fan mode. Leakage to the fan duct is impossible during the jet mode due to the high-velocity, low-pressure area developed at the opening of the duct. In a second embodiment, fluidic techniques are utilized to divert the exhaust gas flow without the use of any mechanical vanes. The frictional losses in the tailpipe due to the extremely high velocities of the exhaust stream are compensated for by a series of vents located in the tailpipe duct which admit a secondary flow of air to the main jet flow. The adjustable vents also provide constant engine speed throttling and control as an aid during conversion.

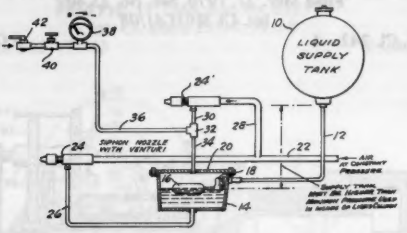
3,618,862
APPARATUS FOR CONTROLLING THE DISPERSION OF LIQUID IN AN AIR NOZZLE

Morton E. Phelps, 9417 New Benton Highway, Little Rock, Ark., and Tommy O. Bell, Hallsville, Tex.

Filed Nov. 21, 1969, Ser. No. 878,759
Int. Cl. B05b *7/30*
U.S. Cl. 239—341 **2 Claims**

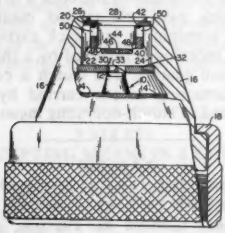
A liquid supply tank carrying a solution of insecticide, herbicide, fertilizer, etc., feeds, by gravity, to a constant level

float control chamber. A pipe connects the interior of the float chamber above its liquid level to a source which, optionally, may provide absolute pressure above or below atmospheric. The float chamber, below its liquid level, is connected to the suction side of an eductor type of nozzle



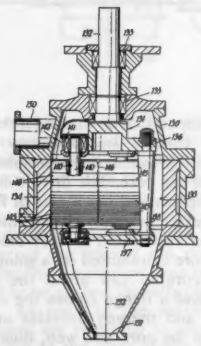
operated by air at constant pressure for any particular distribution. The supply of liquid permitted to be drawn by eductor action and distributed by the nozzle is regulated by regulating the head, positive or negative, in the space above the liquid level in the supply chamber.

3,618,863
ATOMIZING NOZZLE ASSEMBLY
Nathaniel Hughes, Beverly Hills, Calif., assignor to Energy Sciences, Incorporated, El Segundo, Calif.
Filed Sept. 4, 1969, Ser. No. 855,304
Int. Cl. F23d *11/16*
U.S. Cl. 239—419.3 **11 Claims**



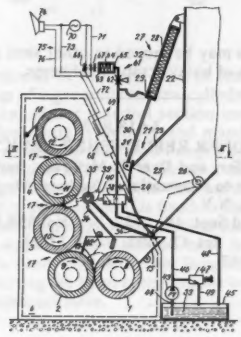
Liquid (e.g., paint) is sprayed with a nozzle having an axial flow passage and coaxial radial holes into the passage spaced 180° apart intermediate the nozzle inlet and outlet.

3,618,864
METHODS OF COMMINUTING PARTICULATE MATTER
Laszlo Lazarus Szego, Lancashire, England, assignor to Vickers Limited, London, England
Filed Apr. 1, 1969, Ser. No. 812,244
Int. Cl. B02c *15/08, 4/10, 15/00*
U.S. Cl. 241—19 **20 Claims**



A method of comminuting particulate material in a mill having loosely mounted roller crushing masses that orbit inside a cylindrical chamber, the material being crushed between the masses and the chamber wall. The material is forced into one end of the chamber suspended in a carrier fluid, such as gas, liquid or a foamed substance, which is directed in a helical path along the chamber wall. The material in the carrier fluid is crushed progressively into smaller particles as it progresses through the chamber.

3,618,865
METHOD AND APPARATUS FOR MILLING PASTY MATERIALS
Roman Alfred Grundler, Sirnach, and Paul Emil Brenner, Oberuzwil, both of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, St. Galen County, Switzerland
Filed May 4, 1970, Ser. No. 34,164
Claims priority, application Switzerland, May 9, 1969, 7058/69
Int. Cl. B02c *4/04*
U.S. Cl. 241—30 **12 Claims**

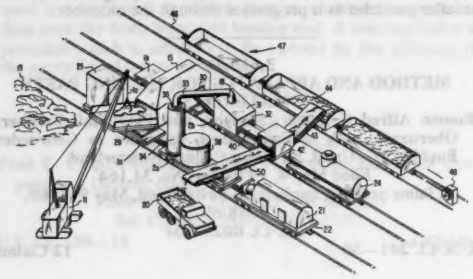


In a method of milling pasty material, such as chocolate, having a tendency to separate out components, between one or more pairs of cooperating friction rollers associated with a pouring trough receiving the material from a supply device which can be blocked from the trough in a controlled manner in dependence on the extent to which the trough is filled with material, both the level of the material in the trough and the flow of the material into the trough are sensed in a coordinated manner and the blocking of the supply device is controlled in accordance with such sensing. The apparatus includes two feeling or sensing levers fixed to oscillate as a unit, these levers being counterbalanced in one direction. When the slide controlling blocking of the supply device is opened, the material moving into the trough engages one of the levers to swing both levers against the bias of the counterweight, moving the other lever into a position where it senses the level of the material in the trough at the nip between two cooperating friction rollers. This provides a control signal resulting in closing of the slide or gate of the supply device. When the level of the material at the nip between the two rollers falls below a predetermined point, the material disengages the other lever and the counterweight swings both levers back to a position where a control means is operated to reopen the slide controlling discharge from the supply device into the trough.

3,618,866
MOBILE SCRAP RECLAMATION
Lloyd B. Robinson, 2614 Walnut St., Alton, Ill.
Filed Aug. 22, 1969, Ser. No. 852,395
Int. Cl. B02c *21/02*
U.S. Cl. 241—101 M **6 Claims**

A method for processing scrap metal at sites not justifying the expense of permanent scrap-processing equipment utilizes a mobile metal reclamation unit including scrap-processing apparatus mounted on railroad cars which are moved to sites containing a limited amount of bulky scrap materials. The scrap material is then formed into more com-

pact scrap material with the apparatus mounted on railroad cars, and upon completion of processing of the scrap material the apparatus may be moved to other sites also containing limited amounts of bulky scrap metal items.

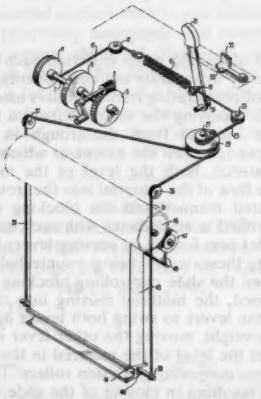


3,618,867

TONER REPLENISHER DEVICE

Richard A. Berlier, and Dyer T. McCrory, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 18, 1969, Ser. No. 858,988
Int. Cl. B02c *4/00, 23/02*
U.S. Cl. 241—167 **9 Claims**



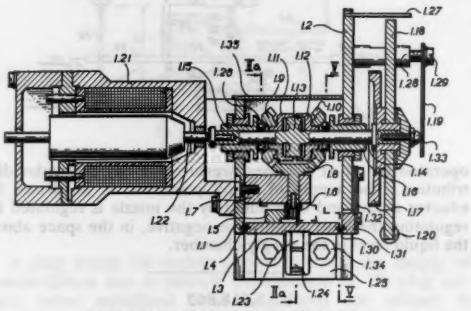
A toner replenisher unit for an electrostatic copying device. The toner particles are abraded off a solid toner block. Constant pressure is maintained between the toner block and the abrading roll throughout the consumption of the toner block by a spring acting through a ratio pulley, such that the spring force reduces as the weight of the toner block is reduced. Loading of the abrading roll is prevented by a brush which removes any toner particles. Toner particles, which do not freely fall from the brush, are removed by a brush wiper. Means are provided for accepting and positioning the toner block with an attached pallet so that the upper surface of the pallet is substantially parallel to a chord described by the edges of the surface ground into the toner block by the abrading roll.

3,618,868

INDEXING CORE HOLDER FOR A TOROIDAL WINDING MACHINE

Bohuslav Vavrinec, Prague, Czechoslovakia, assignor to Tesla, narodni podnik, Praha, Czechoslovakia

Filed Mar. 27, 1970, Ser. No. 23,409
Int. Cl. H01f *41/08*
U.S. Cl. 242—4 **5 Claims**



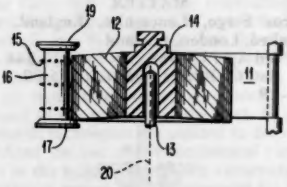
Small rectangular toroidal cores are held for winding by a pair of clamping jaws mounted on a slide to be indexed for precise placement of the winding by a reversible, step-by-step transmission. The transmission includes a driven cam acting through a stepping pawl and ratchet means to drive associated gearing terminating in a rack carried by the slide. The direction of indexing is reversed by a shiftable, two-way bevel clutch in said gearing. The clutch is controlled by adjustable switch-actuating means carried by the slide and operably connected to clutch-operating means.

3,618,869

SERVOING MECHANISM FOR IMPROVED TYPEWRITER RIBBON SPOOLING

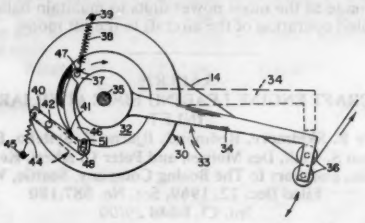
David R. Cialone; Clifford E. Herrick, and George T. Slaughter, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,233
Int. Cl. B65h *17/02, 17/08*
U.S. Cl. 242—67.3 **7 Claims**



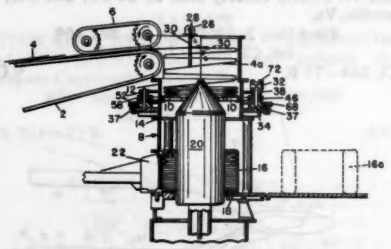
A web-spooling apparatus for winding a thin web on a core is constructed to control any tendency of the web to telescope. A drive roller rides on the periphery of the web as it winds the web on the core. The drive roller includes web-penetrating radial spikes and has a pair of flanges at the top and bottom which extend radially beyond the spikes and contact the edges of the web should the web tend to move axially off the core. The core is mounted on a spindle in such a way as to permit the core to yaw about the spindle. Contact between the web and a flange causes the core to be yawed about the spindle and thereby provides an angle of small magnitude between the core and web, thus causing the web to move axially in a direction opposite to its first such action, thereby tending to correct the telescoping condition.

3,618,870
TENSION CONTROL APPARATUS
Frank Samuel Martin, Wenham, Mass., assignor to The Gillette Company, Boston, Mass.
Division of Ser. No. 586,713, Oct. 14, 1966, Pat. No. 3,465,935.
Filed Feb. 17, 1969, Ser. No. 831,791
Int. Cl. B65h 25/24, 59/38
U.S. Cl. 242—75.43 2 Claims



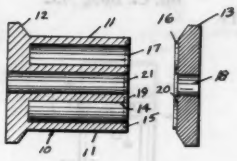
A tension control and brake assembly for maintaining tension on strip material includes a coil support having a braking surface, and a tension control arm pivotally mounted at the coil support and having its arm extending in the direction of the strip leaving the coil. A guide member is positioned on the arm at a point remote from the pivotal mounting of the arm for engaging the strip. A brake structure is disposed to brake the rotation of the coil support. A link connects the tension control arm and the brake and is arranged to actuate the brake on movement of the tension control arm in the direction of rotation of the coil. A first spring urges the tension control arm in the direction of rotation of the coil, and a second spring urges the brake into engagement with the coil support.

3,618,871
ROD-INTERCEPTING MEANS IN A COIL-FORMING CHAMBER
Martin Gilvar, Westboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed Aug. 1, 1969, Ser. No. 846,864
Int. Cl. B65h 54/76
U.S. Cl. 242—81 7 Claims



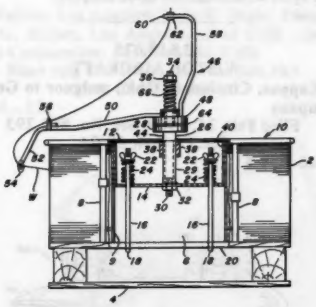
The invention relates to a rodmill in which nonconcentric convolutions of continuous rod deposited on a conveyor or concentric convolutions delivered directly by a laying head are collected in coil formation in a chamber. The chamber (often referred to in the industry as a reforming chamber or tub) includes novel mechanism in the form of fingers which may be moved simultaneously into the upper part of the chamber to intercept the leading rod convolutions coming from the next billet for a sufficient time to permit the previously formed coil to be pushed laterally out of the lower part of the chamber. As soon as the previous coil has been removed, the fingers are retracted to allow the temporarily arrested rings to fall to the floor of the chamber to be followed by the remaining convolutions of the rod as they are continuously delivered by the conveyor or laying head to the chamber. Alternatively, the fingers may be actuated to intercept the falling convolutions at any intermediate position to provide an opportunity to cut the rod, thereby to subdivide the rod into two or more coils.

3,618,872
SPOOL
Henry J. Witkowski, 5626 E. Lake Road, Erie, Pa.
Filed Sept. 4, 1969, Ser. No. 855,211
Int. Cl. B65h 75/14
U.S. Cl. 242—118.61 3 Claims



A spool for thread of the type used in textile industry or the like made up of a generally hollow cylindrical body and a hollow cylindrical center mandrel section concentric to the outside cylindrical body. The body and mandrel section are both integrally molded to the fixed flanged end section. The separable end section is in the form of a disk with a hole adapted to align with the hole in the mandrel section. A bead, V-shaped in cross section, is fixed to the separable end flange and a groove having a cross section shape that is complementary in shape to the V-shaped head is formed in the distal end of the body. The separable flange may be fixed to the body by inserting the bead in the groove and affixing it by means of a suitable adhesive.

3,618,873
SPINNER-TYPE WIRE UNCOILING APPARATUS
Silas C. Fons, and Richard P. McDermott, both of Waukegan, Ill., assignors to United States Steel Coporation
Filed May 21, 1970, Ser. No. 39,187
Int. Cl. B65h 49/00
U.S. Cl. 242—128 6 Claims



Apparatus especially suitable for paying off wire from a cored bundle or coil or wire positioned eye-up on a skid or a pallet. The apparatus includes a hat member consisting of a plate with a centrally disposed crown adapted to be positioned with the plate resting on the upper surface of the coil and the crown fitting into the eye of the coil. Holddown rods are provided which are anchored at their bottom ends to the skid or pallet with their upper ends passing through the crown of the hat member when the apparatus is positioned on a coil of wire. Helical coil springs surround the portion of each of the rods above the crown and a wing nut threaded on the upper end of each rod holds the spring in compression so that the crown of the hat member is constantly urged in-

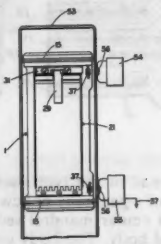
wardly of the eye of the coil of wire. A spindle extends centrally from the bottom of the crown to a point above the plate of the hat member. A spinner payoff mechanism is rotatably mounted on the spindle and a brake is provided for controlling the speed of rotation of the spinner payoff mechanism.

3,618,874

PNEUMATIC CARRIER LATCH SENSING DEVICE

Dale O. Kettering, Canton, and James L. McWhorter, East Sparta, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed June 18, 1970, Ser. No. 47,304
Int. Cl. B65g *5/32*
U.S. Cl. 243—19 **7 Claims**



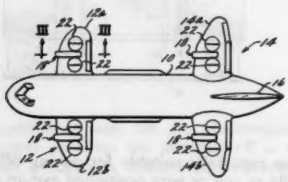
An electrical sensing construction for material-conveying carriers and related terminal stations in pneumatic tube systems, particularly for conducting banking transactions. Electrical sensing coils are mounted in opposite ends of one carrier wall. A switch is mounted within each end of the carrier and is connected to each coil. An actuator pin communicates with each switch for opening and closing the switch. A projecting ear on the carrier door depresses the actuator pin when in closed position which opens the switch. An electrical transmitter and receiver each have an associated coil mounted in the terminal station aligned with the carrier coils when the carrier is at rest within the terminal. A signal from the transmitter is received by the receiver when the carrier switch or switches are closed to indicate an open carrier door. The received signal initiates control functions required to prevent premature launching of the carrier into the pneumatic tube system, if a carrier door is open.

3,618,875

V/STOL AIRCRAFT

Peter G. Kappus, Cincinnati, Ohio, assignor to General Electric Company

Filed Feb. 24, 1969, Ser. No. 801,293
Int. Cl. B64c *29/04*
U.S. Cl. 244—12 B **14 Claims**



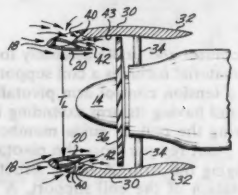
A V/STOL aircraft comprises a fuselage having tandem wings which are offset lengthwise and vertically. Identical propulsion units are provided in each wing half. Each power unit comprises a pair of gas generators mounted respectively above and below the wing half and a pair of lift fans mounted within the wing structure on opposite sides of the engines. A valve system diverts the hot gas stream of the engines into a plenum chamber formed integrally with the wing structure. The hot gas streams are then directed from the plenum chamber to a tip turbine which powers the lift fans when vertical thrust is desired in operation of the aircraft. When forward speed of the aircraft is great enough for the aircraft wings to have sufficient lift, the hot gas streams are directed through propulsive nozzles providing a forward thrust component. In cruise, one engine of each power unit could be shut down. Each engine and each lift fan has emergency capacity which is automatically brought into play in the event of a failure of a lift fan or engine, with proper adjustments being made to the other power units to maintain balance and controlled operation of the aircraft in the lift mode.

3,618,876

AIRCRAFT ENGINE LEADING EDGE AUXILIARY AIR INLET

Wallace E. Skidmore, Redmond; Bjarne E. Syltebo, Bellevue; Wilton S. Viall, Des Moines, and Peter C. Abeel, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1969, Ser. No. 887,180
Int. Cl. B64d *29/00*
U.S. Cl. 244—53 B **3 Claims**



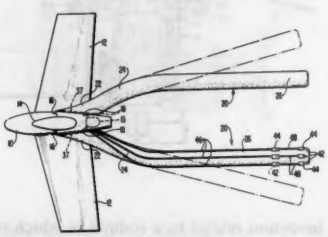
A primary and an auxiliary inlet system for an aircraft jet engine. A rigid leading edge ring pivotally supports exterior and interior foil members which in a first position provide a portion of the cowling forebody fairing and which in a second position coact to provide one wall of an auxiliary inlet. The foils are spring-biased into their first positions for cruise flight and are responsive to aerodynamic pressures caused by changing flight conditions to pivot into said second position for low-speed flight and takeoff conditions.

3,618,877

FLEXIBLE TAIL AIRCRAFT

Franklin W. Peters, Liberty Hall R. D. #5, Box 341, Charlottesville, Va.

Filed Dec. 2, 1969, Ser. No. 881,409
Int. Cl. B64c *17/00, 9/08*
U.S. Cl. 244—75 R **9 Claims**



Aircraft having a pair of elongated, flexible tails for maneuvering as well as stabilizing the aircraft in flight. The tails extend a distance at least three times the length of the fuselage and are hollow to receive compressed air for maintaining the tails in elongated, inflated, rearwardly projecting condition. The compressed air conveyed through the tails may be provided by a turbine associated with a jet engine which propels the aircraft. Maneuverability and stability of the aircraft is achieved upon selective movement of the tails which may be accomplished by controlling the flow of air

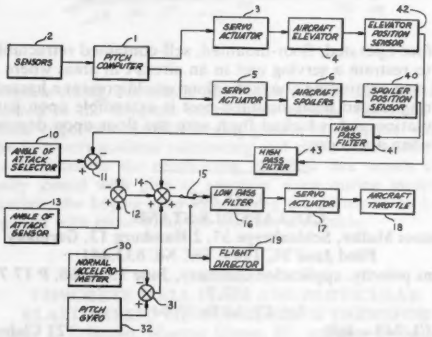
through the tails as well as venting the air from various locations on the tails. Mechanical means may also be provided to supplement actuation of the tails to provide the desired stabilization and maneuverability.

3,618,878

AIRCRAFT THROTTLE CONTROL

James A. Klein, Santa Monica; Lowell O. Lykken, Westlake Village, and Naren M. Shah, Santa Monica, all of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif., by said Lykken and Shah and Collins Radio Company, Dallas, Tex., by said Klein

Filed June 23, 1969, Ser. No. 835,513
Int. Cl. B64c 13/18
U.S. Cl. 244—77 D 15 Claims



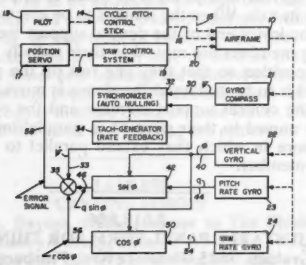
An aircraft controlled in part during descent or ascent by spoilers in the vertical direction, uses a throttle control signal that is derived from the outputs of an angle of attack sensor and a spoiler position sensor. As a result, the changes in the angle of attack occasioned by the movement of the spoilers are compensated. When the aircraft is held on a predetermined flight path and also controlled in part by an elevator in the vertical direction, the output of an elevator position sensor also contributes to the resultant throttle control signal as a long-period anticipatory term.

3,618,879

PITCH/ROLL TO YAW FLIGHT COORDINATOR

Milford R. Murphy, Arlington, Tex., assignor to Bell Aerospace Corporation, Hurst, Tex.

Filed Aug. 14, 1969, Ser. No. 849,988
Int. Cl. B64c 13/18
U.S. Cl. 244—77 E 6 Claims



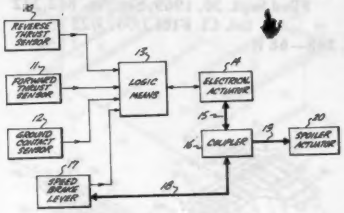
A pilot maneuvering aid wherein a yaw control signal is made proportional to the difference between C and the sum A+B where A is the product of pitch rate and the sine of the roll angle, B is the product of yaw rate and the cosine of the roll angle, and C is turn rate.

3,618,880

SPEED BRAKE SYSTEM FOR AIRCRAFT SPOILERS

Edward A. Hagaman, Bellevue; Lyle F. Stayner, Seattle, and Sherman M. Bissell, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 11, 1970, Ser. No. 36,042
Int. Cl. B64c 9/34
U.S. Cl. 244—113 11 Claims



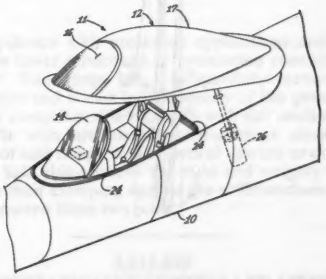
A system for allowing automatic or overriding manual actuation of an aircraft's spoilers as an airspeed brake includes a speed brake lever disposed adjacent the pilot whose movement is coupled to a spoiler actuator by suitable mechanical linkage and a logic means which receives inputs from a reverse thrust sensor, a forward thrust sensor, a ground contact sensor, and the speed brake lever. The logic means combines these inputs according to a predetermined schedule to accordingly provide a deploy or a retract output signal to an electrical actuator which in turn provides a mechanical movement which is coupled to the spoiler actuator and to the speed brake lever by another mechanical linkage. The inputs and predetermined schedule allows for automatic deployment of the spoilers as a speed brake under normal landing, abnormal landing, and refused takeoff maneuvers, and allows automatic retraction of the spoilers during any go-around or refused landing maneuver. An embodiment of each of the system elements is illustrated and described as is an embodiment of a mechanical coupler between the spoiler actuator, the electrical actuator, and the speed brake lever, which coupler provides priority to movements of the speed brake lever over those of the electrical actuator.

3,618,881

COCKPIT ENCLOSURE

Walter E. Fellers, Los Angeles; Leon F. Begin, Pasadena, and Michael G. Huben, Los Angeles, all of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

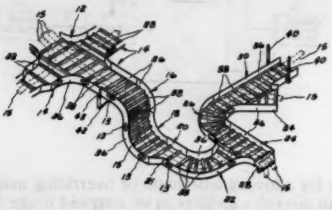
Filed July 31, 1969, Ser. No. 846,363
Int. Cl. B64c 1/14
U.S. Cl. 244—121 2 Claims



A cockpit enclosure or canopy assembly for aircraft including a canopy comprising fore and aft portions and a platelike protective shield constituting armor glass. The forward portion and protective shield constituting primary and emergency windshields, respectively, of the canopy assembly. The protective shield also functioning as a combining glass for head-up display or like equipment. The shield and canopy

assembly cooperating to insure maximum visibility, improved aerodynamic features, reduces clutter and improves neatness etc., of the canopy area.

3,618,882
CABLE SUPPORT TRAY SYSTEM
Henry A. Podedworny, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.
Filed Sept. 30, 1969, Ser. No. 862,222
Int. Cl. F16l *3/08, 3/22*
U.S. Cl. 248—68 R **11 Claims**

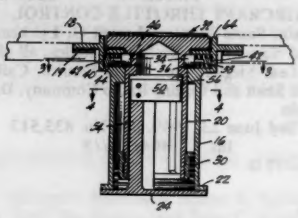


A cable support tray and tray system for the support of cables, tubes and the like, comprised of parallel longitudinal rail sections connected by transverse rungs, which support the cables, tubes, pipes, etc., in a longitudinal direction corresponding to the direction of the rails, and in which the rungs are constructed and arranged so as to accommodate fastening means in such manner as not to protrude beyond the general plane of the cable trays.

3,618,883
ANTENNA MOUNT
Max Cohn, 13 Banner Court, East Brunswick, N.J.
Filed Oct. 29, 1969, Ser. No. 872,157
Int. Cl. E04d *13/00*
U.S. Cl. 248—237 **3 Claims**

An antenna mount adapted for mounting on a variety of different kinds of roofs. A central mast is provided with two pairs of articulated mounting legs each pivoted at one end to the bottom of the central mast and the other end to a slider secured around the central mast and a bracing leg is also pivotally attached to the slider perpendicular to the mounting legs. Movement of the slider varies the orientation of the legs in order to adapt the mount for roofs of various shapes and configurations.

3,618,884
RETRACTABLE TIEDOWN POST FOR SERVICE CART
Herbert W. Wilson, Cypress, Calif., assignor to McDonnell Douglas Corporation
Filed Feb. 2, 1970, Ser. No. 7,516
Int. Cl. B65j *1/22*
U.S. Cl. 248—361 **4 Claims**



A foot-operated, floor-mounted, self-contained retractable post to restrain a serving cart in an aircraft in areas where a fixed post protruding above the floor would present a hazard. A spring-loaded flush-mounted post is extendible upon partial rotation and is locked flush with the floor upon depression when not in use.

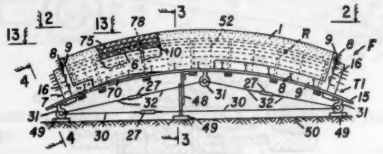
3,618,885
COLLAPSIBLE STAND
Johannes Muller, Schlankreye 37, 2 Hamburg 13, Germany
Filed June 16, 1969, Ser. No. 833,441
Claims priority, application Germany, June 15, 1968, P 17 73 637.7
Int. Cl. A47b *97/04*
U.S. Cl. 248—460 **22 Claims**

A rodlike center support member slidably extends through a sleeve. The latter is provided on at least one end face with three or more angularly offset slots radiating from the bore of the sleeve. Each of the recesses receives an end portion of a contact or engaging member which is so secured in the respective recess that it can be moved from a position in which it extends radially outwardly from the bore inclined to the axis thereof to a position in which it extends in parallelism with its axis. When the stand is to be erected the sleeve is slid to the lower end of the central support member and the engaging members are moved to their radially outwardly extending position so that they can rest on the ground. When the stand is to be collapsed the sleeve is moved to the upper end of the central support member and the engaging members are moved to their position in parallelism with the axis of the bore in which they extend parallel to the elongated support member.

3,618,886
ADJUSTABLE PANEL FORM FOR THIN SHELLS
Phillip Graham, 2825 Glenmore Ave., Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 802,348, Feb. 26, 1969, now abandoned, Continuation-in-part of application Ser. No. 540,314, Apr. 5, 1966, now Patent No. 3,467,354. This application July 18, 1969, Ser. No. 843,037
Int. Cl. B28b *7/02, 7/22*
U.S. Cl. 249—13 **13 Claims**

This invention pertains to a low cost adjustable form that can be adjusted for forming various types of two-way curved,

precast, reinforced thin shell cementitious and plastic panels for small spanned building shells having uniform scalloplike, corrugated shells like the shells shown in my U.S. Pat. No. 3,154,888 and to the method of making the same. The form can be adjusted so as to mold different original types of panels, that differ by having different curvature, and/or different size. The form has a base with an adjustable template frame. A thin reinforced base coating is mounted within the



template frame. An elastic edge form that is like a gasket, is secured to the template frame with metallic fasteners. The elastic edge form molds a keying groove in the panel edging. The fasteners position reinforcing and clevis connectors that are attached to the reinforcing, to allow like panels to be easily joined with pins at erection, even during inclement weather, the keying grooves allowing the panels to be keyed together with grout when the weather is suitable.

3,618,887

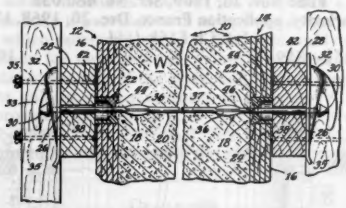
CONCRETE WALL FORM AND PARTICULAR ELASTOMERIC TIE ROD BUSHING THEREFOR

George J. Eriksson, Morton Grove, Ill., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Apr. 23, 1969, Ser. No. 818,515

Int. Cl. E04g *17/08*

U.S. Cl. 249—40 **8 Claims**



A tie rod bushing which is pressed into a hole in a plywood panel of a concrete wall form and has a flexible lip which enables the tie rod to be projected through the bushing during form erection and prevents poured concrete from seeping past the bushing. In one form of bushing, the inner end face thereof lies flush with the inner side or face of the panel so that when the panel and bushing are removed, the wall surface is substantially continuous. In another form of bushing, the bushing projects into the concrete and leaves a socket in the latter when the panel and bushing are removed.

3,618,888

CASTING FORMS

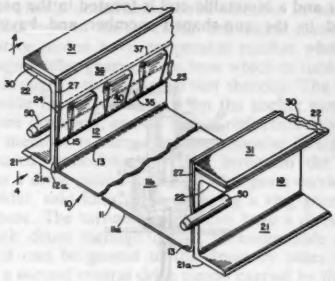
Mark J. Wise, Dayton, Ohio, assignor to The Flexicore Co. Inc., Montgomery County, Ohio

Filed July 22, 1969, Ser. No. 843,636

Int. Cl. B28b *7/06*

U.S. Cl. 249—50 **4 Claims**

A long, steel open-ended form has upstanding smooth sides from the form bottom to provide full width of a concrete slab casting; the sides then continuing upwardly and inwardly to reduce the width of a casting slab; after which the form side continues upwardly for constant but reduced slab width; the upwardly and inwardly disposed form side being flat but having at least 50 percent of its casting surface "dimpled" inwardly of the casting region with the "dimple" depth being a maximum at or near the top of the inwardly extending side



portion and reduced to zero at or near the bottom of said portion.

3,618,889

CASING-DEVICE FOR THE REINFORCED OR PRESTRESSED CONCRETE FLANGE OF A GIRDER

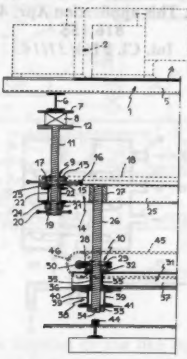
Abraham Lipski, Uccle, Belgium, assignor to Procedes Nouveauz de Construction Preflex Societe Anonyme, Saint-Gilles, Belgium

Filed Oct. 2, 1969, Ser. No. 863,228

Claims priority, application Belgium, Oct. 15, 1968, 64764

Int. Cl. B28b *7/08*

U.S. Cl. 249—50 **10 Claims**



A casing-device with numerous applications and varying sizes for the lower reinforced or prestressed concrete flange of a girder. Said flange has a substantially rectangular or square section and is cast independently of the girder's web. Said device comprises side-elements with side-sections and a casing soffit with articulated soffit-sections allowing the realization of said flange with a vertical upward or downward deflection. Said side-sections are rigid and weighty in order to facilitate their clamping against the soffit-sections and the tightness between these two parts.

3,618,890

THERMOSTATICALLY CONTROLLED AIRFLOW REGULATOR

Hans-Dieter Bastam, Gerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 6, 1970, Ser. No. 61,630

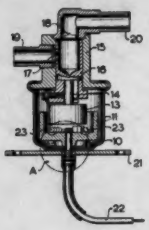
Claims priority, application Germany, Aug. 12, 1969, P 19 40 989.3

Int. Cl. F16k *31/00*; **F03g** *7/06*

U.S. Cl. 251—11 **8 Claims**

A housing has a passage provided with a surface portion defining a valve seat. An inlet and an outlet terminate in this

surface portion and each have an exposed cross section. A cup-shaped member of insulating material is located in the aforementioned passage longitudinally spaced from the valve seat. An electric heating device is arranged in the cup-shaped member and a bimetallic coil is located in the passage partly received in the cup-shaped member and having a freely



movable end portion capable of movement circumferentially of the passage in response to temperature fluctuations. A rotary valve member engages the valve seat and is connected with the end portion so as to be rotated by the latter with corresponding variations in the exposed cross sections of the inlet and outlet.

3,618,891

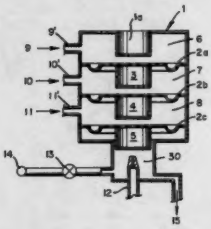
DEVICE FOR SELECTING EXTREME VALUE OF PLURAL INPUT SIGNALS

Karl Heinz Topfer, Dresden; Karl August Arnulf Schwarz, Dresden, and Walter Dieter Schrepel, Friedewald uber Radebeul I, all of Germany, assignors to Deutsche Akademie Der Wissenschaften, Berlin, Germany

Continuation of application Ser. No. 556,655, June 10, 1966, now abandoned. This application Apr. 4, 1969, Ser. No. 816,155

Int. Cl. F16k *31/145*

U.S. Cl. 251—61.2 **6 Claims**



A fluid-operated apparatus for selecting extreme magnitudes, that is, the maximum or minimum magnitudes from several input signals, including a housing which is divided into several uniform chambers which are totally closed for the exception of the input thereto. The chambers are separated by flexible diaphragms carrying actuating projections thereon which transmit the pressure signals to the adjacent membranes or diaphragms, the last actuating means producing a signal corresponding to the extreme value present in one of the chambers by releasing such signal from a fluid source.

3,618,892

SLEEVE-OPERATED VALVED COUPLING

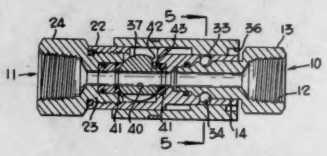
Joseph S. Sciuto, Jr., Crestwood, Mo., assignor to Stile-Craft Manufacturers, Inc., St. Louis, Mo.

Filed Dec. 12, 1968, Ser. No. 783,315

Int. Cl. F16l *37/28*

U.S. Cl. 251—149.2 **11 Claims**

A coupling having a ball valve member rotatively supported in a valve chamber of a tubular body, the ball valve member being provided with a substantially straight passage that communicates a chamber inlet and outlet when the ball valve member is located in the valve-open position. A plug is received in a body socket and communicates with the chamber outlet. When the ball valve member is disposed in the valve-open position, a substantially straight through flow passageway is provided in the coupling. A sleeve, slidably mounted on the body, and the ball valve member are interconnected by a means that selectively moves the ball valve member to the valve-open or valve-closed position upon slidable longitudinal actuation of the sleeve. The interconnecting means includes a transverse groove in the ball valve member which receives a pin carried by and movable with



the sleeve, the pin engaging opposed groove shoulders to turn the ball valve member as the sleeve is longitudinally manipulated. The same pin operates in a body opening of predetermined configuration to control longitudinal sleeve movement and to lock the sleeve selectively in at least one limit when the ball valve member is in its valve-closed position, the sleeve being angularly related on the body, when so locked, to permit insertion or withdrawal of the plug relative to the body socket. The sleeve is rotatable out of locked position to latch the plug and is then capable of longitudinal sliding movement to actuate the ball valve member.

3,618,893

ANTIVIBRATION VALVE SEAT ASSEMBLY

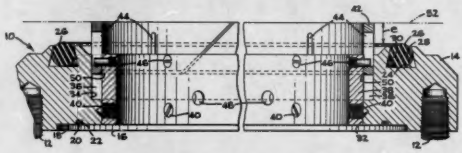
Louis, Bois, Sens, France, assignor to Societe Technique Et Commerical D' Installation1 Industrielles "Luceat," Sens(Yonne), France

Filed Nov. 26, 1969, Ser. No. 880,038

Claims priority, application France, Dec. 20, 1968, 179,511

Int. Cl. F16k *1/44*

U.S. Cl. 251—359 **10 Claims**



An antivibration seat assembly especially for a relief-type valve, comprising an annular body adapted for removable installation in the valve's flow passage, a resilient seat to establish a seal between the body and the valve's plate or closure member, and an auxiliary floating seat within a chamber surrounding the flow passage through the body. The floating seat moves axially to an extended position in response to a pressure differential between its end surfaces when the valve's closure member approaches the closed position, and during the final closing movement of the closure member, the floating seat remains in contact with it, eliminating undesirable vibrations.

3,618,894

VEHICLE-JACKING APPARATUS

Gerald R. Meyer, R.R. #1, Centerville, Mich.

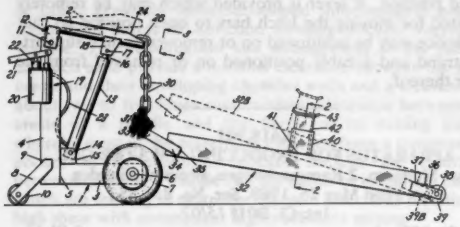
Filed Mar. 31, 1970, Ser. No. 24,285

Int. Cl. B60p *1/48*

U.S. Cl. 254—8 R **6 Claims**

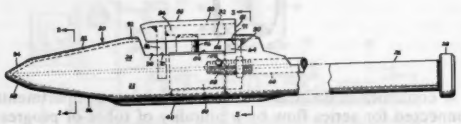
A hydraulic cylinder on a wheeled carriage vertically swings a lever. A chain suspended from the lever adjustably engages one end of a lift beam. The beam has a ground en-

gaging roller at its opposite end, and a vehicle-engaging seat located between the ends of the beam rises as the lever tilts



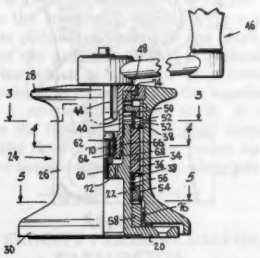
the beam to jack the vehicle from a point remote from the carriage.

3,618,895
SPREADER FOR DAMAGED CORES
James J. Van Gompel, Fremont, Ind., assignor to Brammall Inc., Angola, Ind.
Continuation-in-part of application Ser. No. 848,507, Aug. 8, 1969, now abandoned. This application May 14, 1970, Ser. No. 37,225
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 R **41 Claims**



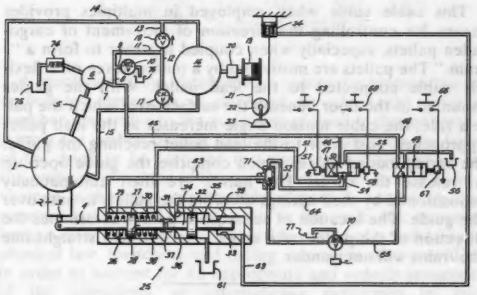
An elongated body is provided with a fixed tapered nose portion which facilitates entry of the body into a damaged core. The body is provided with an opening in the upper part thereof which receives a shoe. A shoe is movably supported by the body for movement in a direction substantially perpendicular to the axis of the body, and a guide means is provided for guiding such movement of the shoe. A hydraulic ram is provided for operating the shoe to move it outwardly of the body. An attachment is also provided to enable a larger shoe to be employed with the apparatus.

3,618,896
RATCHET WINCHES
Richard W. Bewley, P.O. Box 531, Southport, Conn.
Filed Dec. 17, 1969, Ser. No. 885,716
Int. Cl. B66d *1/30*
U.S. Cl. 254—150 **14 Claims**



Direct-drive and gear-drive winches comprising a base for securement to a boat deck, said base having an upstanding post on which a winch drum is journaled. At the top of the drum there is a socket member adapted to receive a driving plug of a crank handle by which power is applied to the winch drum. The socket member, also journaled on the upstanding post of the base, either directly or through ring gearing drives one of a pair of ratchet wheels the other of which is connected to the drum, to effect rotation in one direction. In different embodiments, the drum and base have cooperable ratchet wheels constituting back checks. In one gear-driven embodiment of the invention the socket member and a central drive pinion have cooperable ratchet wheels, the pinion engaging idler gears on the base which in turn engage the drum through a ring gear carried thereby. The ratchet wheels provide for direct drive when the socket member is turned on one direction, and for a gear-reduction drive when the socket member is turned in the opposite direction. In another geared embodiment of the invention the socket member has a drive pinion engaging idler gears carried on a turnable spider, said idler gears engaging a ring gear of the stationary base. The turnable spider can have a direct drive of the winch drum through a pair of cooperable ratchet wheels, or it can be geared to the drum by other ratchet wheels and a second central drive pinion carried by the base. The second drive pinion engages idler gears turnably carried by the base, which latter gears in turn engage an internal ring gear on the winch drum. Turning of the socket member in one direction effects a gear drive having one specified ratio, and turning of the socket member in the opposite direction effects a gear drive to the winch drum having another ratio.

3,618,897
CONSTANT TENSIONING SYSTEM
John J. Swoboda, Jr., 5602 Chippendale, and Norman L. Swoboda, 2009 E. Rosebud, both of Victoria, Tex.
Filed June 25, 1969, Ser. No. 836,298
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **1 Claim**

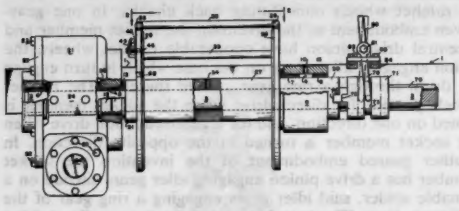


A winch drum or capstan or the like upon which a load-bearing cable or rope is reeled is operated by an hydraulic, hydrostatic transmission through a suitable gear reduction. The transmission is adjustable as to direction as well as output rate by means of a feedback system including a servomotor or valve which has manually selected automatic and manual modes. In the automatic mode, a load cell or other instrumentality directly sensing the tension in the cable or rope acts through the servomotor to adjust the transmission and thereby actuate the reeling device as required to maintain the desired tension in the cable or rope. In the manual mode, the tension sensing instrumentality is rendered ineffective to adjust the transmission.

3,618,898
WINCH
Elmer L. Notestine, 2232 S.E. 154th St., Portland, Oreg.
Filed July 2, 1969, Ser. No. 838,495
Int. Cl. B66d *1/02*
U.S. Cl. 254—187 **1 Claim**

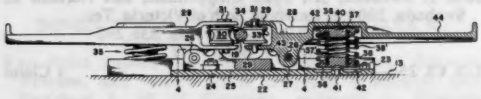
A winch having a main shaft of uniform diameter throughout its length journaled in spaced-apart bearings interconnecting parallel frame members, and a winding drum rotatable about the main shaft between certain of said bearings to thereby provide a rigid assembly which is longitu-

dinally and laterally torsion stiff under all lateral and longitudinal impact forces throughout its length, and wherein the



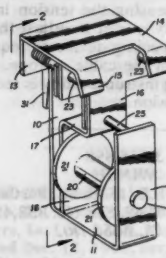
work load stresses are transmitted through the bearings and not to the main shaft, as in other winches I am aware of.

3,618,899
CABLE GUIDE
John K. Hancock, Jr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed June 1, 1970, Ser. No. 42,208
Int. Cl. B66d 1/36
U.S. Cl. 254—190 5 Claims



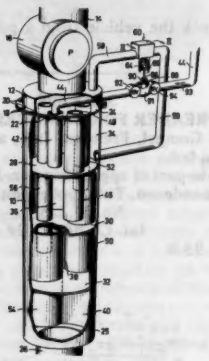
This cable guide when employed in multiples provides means for controlling the direction of movement of cargo-laden pallets, especially when coupled together to form a "train." The pallets are motivated by a pulling force on a flexible cable connected to the lead pallet. With the guides mounted to the floor beneath the surface over which the pallets ride, the cable tension angle increases as the lead pallet approaches. Just prior to the lead pallet reaching the guide, the spring-loaded halves which comprise the guide open up to release the cable. The halves are then automatically repositioned by their springs allowing the pallets to pass over the guide. The location of subsequent guides determines the direction of the pallet train and if arranged in a straight line the trains will not wander.

3,618,900
CABLE ROLLER
Samuel J. Sowards, 217 W. Lincolnway, Lisbon, Ohio, and William L. Reali, Jr., 1746 Kensington Ave., Youngstown, Ohio
Filed Jan. 29, 1970, Ser. No. 6,729
Int. Cl. B66d 1/36
U.S. Cl. 254—194 4 Claims



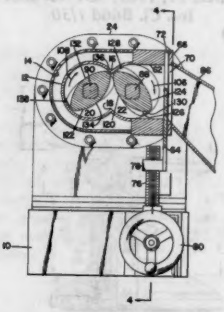
A cable roller includes a body structure mounting a roller in its lower portion and a projecting hooklike configuration in its upper portion by means of which it is supported on a strand to which the cable is to be attached. Movable latch bars are arranged to close the area of the body structure adjacent the roller and the projecting hooklike configuration and springs are provided to bias the latch bars into normally closed position. A lever is provided which may be remotely actuated for moving the latch bars to open position so that the device may be positioned on or removed from a supporting strand and a cable positioned on or removed from the roller thereof.

3,618,901
APPARATUS FOR PRODUCING A WATER GEL
Gustav Sindgren, 2 Ramsundsvagen, Bromma, Sweden
Filed May 26, 1969, Ser. No. 827,552
Int. Cl. B01f 15/02
U.S. Cl. 259—4 8 Claims



A container is divided into several mixing compartments connected for series flow by a plurality of tubes of progressively increasing diameter. Water is introduced into each but the first compartment by a supply tube concentric with the connecting tube. A gel-forming agent is pumped into the first compartment at a rate dependent on the difference between the water supply pressure and the pressure in the first compartment. The water gel mixture produced is progressively diluted in each mixing compartment.

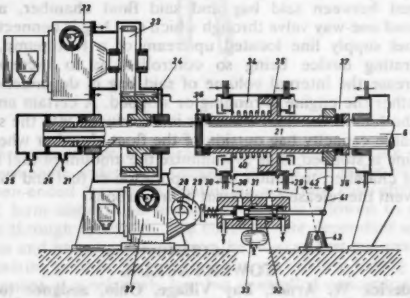
3,618,902
CONTINUOUS MIXER
Ambrose K. Brennan, Jr., Thomasville, Pa., assignor to Teledyne Inc., York, Pa.
Filed Nov. 14, 1969, Ser. No. 876,681
Int. Cl. B01f 7/04
U.S. Cl. 259—6 3 Claims



A continuous mixer for intimately mixing, kneading, blending and/or reacting a wide variety of materials, the mixer including a horizontal mixing barrel which in cross section is in the form of intersecting major arcs providing a pair of side-by-side communicating cylindrical chambers with a material inlet adjacent one end and a material outlet at the opposite

end. An axially extending shaft is disposed in each chamber having secured thereon a plurality of contiguous progressively offset generally lenticular-shaped interengaging paddles rotating in the same direction forming pockets varying in volume. The construction and arrangement of the paddles are such as to provide a minimal clearance between the rotor crests and their enveloping chamber walls and a clearance of about two to five times such minimal clearance between the crests of a paddle and the flanks of its mating paddle whereby most of the material is extruded from a compression pocket to an expansion pocket through the clearance between crests of a paddle and the flanks of its mating paddle which are moving in mutually opposite directions resulting in high shear with consequent highly efficient mixing.

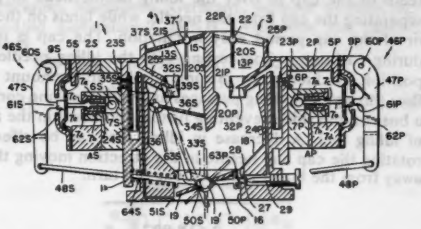
3,618,903
MIXING AND KNEADING DEVICE
Fritz Ronner, and Fritz Sutter, both of Pratteln, Switzerland, assignors to Buss A. G., Barfusserplatz, Basel, Switzerland
Filed Mar. 30, 1970, Ser. No. 23,796
Claims priority, application Switzerland, Apr. 2, 1969, 5387/69, Feb. 5, 1970, 1778/70
Int. Cl. B01f *7/00*
U.S. Cl. 259—102 **16 Claims**



A mixing and kneading device comprising a housing and a shaft mounted therein. The shaft carries a conveyor helix and mixing and kneading vanes. The vanes cooperate with stationary elements in the housing to carry out the kneading and mixing functions. The shaft is rotated by a variable speed rotary motor and is also reciprocated to move the vanes toward and away from the stationary elements by a pressure fluid motor having its piston connected to the shaft. The rate of reciprocations of the piston and shaft is cyclically controlled by a valve device which is actuated by a cam driven by a variable speed motor to thereby vary the number of reciprocations during a revolution of the shaft. A second valve device regulates the flow of pressure fluid during a cycle to reduce or stop the flow of fluid to the piston near the end of the shaft's stroke toward the stationary elements.

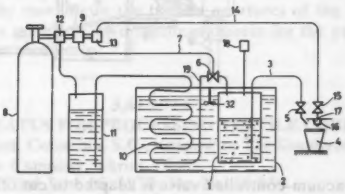
3,618,904
HIGH VELOCITY PRESSURE DIAPHRAGM CARBURETOR
Stephen Woods, 14155 Shadywood Drive, Plymouth, Mich.
Continuation-in-part of application Ser. No. 822,828, Apr. 9, 1969, now Patent No. 3,556,067, which is a continuation-in-part of application Ser. No. 629,488, Apr. 10, 1967, now abandoned. This application July 31, 1969, Ser. No. 846,563
Int. Cl. F02m *7/06*
U.S. Cl. 261—23 A **14 Claims**

The disclosure relates to a carburetor having a closed fuel reservoir or chamber to eliminate vapor losses. A mechanical linkage including a cam operated by the throttle valve con-



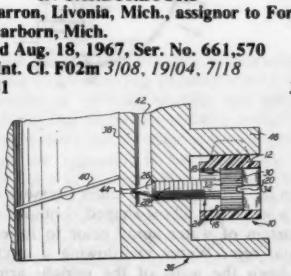
trols fuel flow to the reservoir or chamber at off-idle, part-throttle and wide-open throttle.

3,618,905
MACHINE FOR THE PRODUCTION OF AERATED BEVERAGES
Sergio Primus, Pordenone, Italy, assignor to I.M.D. Italiana Macchine Distribuzione S.p.A., Bergamo, Italy
Filed Feb. 13, 1970, Ser. No. 11,165
Claims priority, application Italy, Feb. 21, 1969, 13195/A/69
Int. Cl. B01f *3/04*
U.S. Cl. 261—153 **7 Claims**



A machine for the instantaneous automatic preparation of carbonated beverages is disclosed in which the sensing member responsive to the variations of level in the tank containing the carbon-dioxide saturated water forming the base of the drink to be prepared is a pressure-stat responsive to the pressure obtaining in the carbonated water tank. The advantage is that the only variable magnitude sensed by the pressure-stat is the level of water in the tank, the pressure being a direct function of said level by virtue of a well known physical law. Switching and timing means are also provided in order to warrant for an appropriate and orderly sequence of the operations, as automatically performed by the machine, inherent in the preparation of an "instant" carbonated beverage. Thus, for example, means are provided to dispense a flavoring substance (such as lemon essence in the case of a lemonade and so forth) at the proper instant of time and in the appropriate amount. The amount of carbonated beverage dispensed for each drink dosage is constant, and the constancy of the carbonation (i.e. amount of carbon dioxide contained in a volume unit of water) is also ensured.

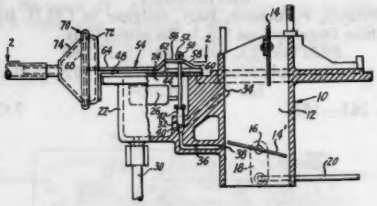
3,618,906
DEVICE AND PROCESS FOR LIMITING IDLING FUEL IN CARBURETORS
William W. Charron, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Aug. 18, 1967, Ser. No. 661,570
Int. Cl. F02m *3/08, 19/04, 7/18*
U.S. Cl. 261—41 **3 Claims**



A polyamide cap fits tightly over the head of the idling needle and a vane on the cap abuts a boss on the carburetor

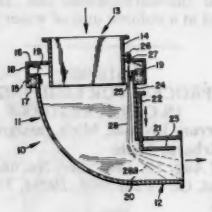
body to prevent needle rotation in one direction. Internal teeth of the cap fit over the idling needle head to prevent separating the cap from the needle, while lands on the interior of the cap permit easy installation. The cap is installed during carburetor flow testing with the idling needle in the position producing the maximum allowable amount of fuel flow through the idling passages and with the vane contacting a boss on the side preventing further increases in the amount of idling fuel. A decrease in idling fuel can be effected by rotating the cap and needle in the direction moving the vane away from the boss for almost one full turn.

3,618,907
ANTISMOG CARBURETOR
Alpha Severn, 5316 S St., Sacramento, Calif.
Filed Jan. 28, 1969, Ser. No. 794,604
Int. Cl. F02m 7/12
U.S. Cl. 261—41 D **1 Claim**



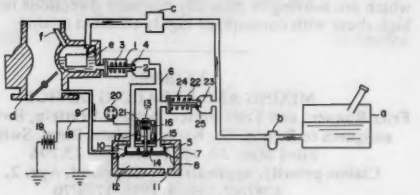
A vacuum-controlled valve is adapted to cut off the admission of fuel to a carburetor idling jet when the motor vehicle is decelerated and vacuum in the intake manifold is high. The engine thus acts as a brake, and when deceleration takes place to a predetermined extent, the drop in vacuum, that is, increase in pressure in the intake manifold, opens the valve to admit fuel to the carburetor to prevent the motor from stalling.

3,618,908
GAS SCRUBBERS
Arthur F. Stone, Madison, N.J., assignor to Air Pollution Industires, Inc., Englewood, N.J.
Filed June 10, 1969, Ser. No. 831,889
Int. Cl. B01d 47/00, 47/06
U.S. Cl. 261—62 **4 Claims**



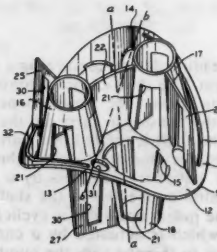
Gas to be scrubbed is fed under pressure down the upright arm of a generally elbow-shaped conduit and is intercepted by a curtain of water spray prior to its entrance into the horizontal arm. Water overflowing a circumferential weir drains down the walls of the upright arm. An adjustable damper controls the area of the passage immediately behind the water curtain.

3,618,909
EVAPORATION-INHIBITING DEVICE FOR A CARBURETOR
Tadahide Toda; Mitsumasa Yamada, and Hidekatsu Miyake, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha Toyota-cho, Toyota, Aichi Prefecture, Japan
Filed Apr. 30, 1969, Ser. No. 820,557
Claims priority, application Japan, Apr. 30, 1968, 43/28675
Int. Cl. F02m 5/12
U.S. Cl. 261—72 R **3 Claims**



The present invention relates to a device for inhibiting fuel evaporation in a carburetor, said device comprising a variable-capacity bag which communicates with a float chamber in the carburetor and the internal volume of which can be varied by an operating device, a first one-way valve is positioned between said bag and said float chamber, and a second one-way valve through which said bag is connected to a fuel supply line located upstream of a fuel pump, said operating device being so controlled as to increase or decrease the internal volume of said bag in dependence on whether the engine is running or stopped. A certain amount of the fuel in the float chamber is introduced into the sealed variable capacity bag outside of the float chamber when the engine is stopped so as to minimize the amount of fuel in the float chamber, to inhibit the evaporation of fuel and thereby prevent the release of unburnt hydrocarbons.

3,618,910
TOWER PACKING
Frederick W. Arndt, Bay Village, Ohio, assignor to Heil Process Equipment Corporation, Cleveland, Ohio
Filed May 28, 1969, Ser. No. 880,844
Int. Cl. B01f 3/04
U.S. Cl. 261—94 **14 Claims**



A tower packing unit comprising a saddle-shaped platform having a circular edge in plan view and having hollow, slotted, turretlike projections extending up and down on each side of the platform. Slotted buttress vanes standing up and down on each side of the platform in chordal planes of said edge reach radially from each turret to the periphery of the platform. These vanes extend substantially the height of the turrets above the platform and extend in opposite directions from the turrets on the same side of the platform. The platform has openings to the turrets and to the slots in the vanes. The hollow turrets are slotted longitudinally and are of truncated conical form based on the platform. Preferably, there is a pair of such turrets extending away from each side of the

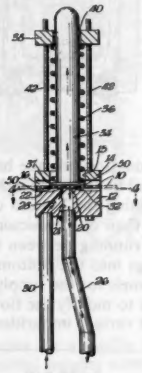
platform with an interconnecting vane joining each pair of turrets in the center of the unit on each side of the platform. These vanes rise from opposite sides of the middle of the platform and lie in planes which contain the longitudinal axis of the unit and lie at right angles to each other.

3,618,911

DYNAMIC GAS-MIXING APPARATUS

Aaron J. Martin, Kennett Square, Pa., assignor to Marlabs, Inc.

Filed Sept. 5, 1969, Ser. No. 855,641
Int. Cl. B01f *3/04*
U.S. Cl. 261—104 **5 Claims**



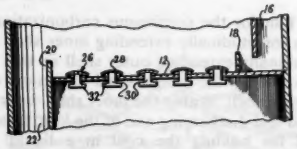
A first gas stream is directed to flow across the face of a gas-permeable wafer. The opposite face of the wafer covers an open-ended receptacle containing a second gas (often in liquid form under high pressure) which is allowed to permeate through the wafer, at a constant rate dependent upon the gas and its temperature, into the flowing first gas stream. This mixing permits the creation of a gas mixture having one component at a relatively low but controlled concentration. The wafer and its associated apparatus is housed in an oven.

3,618,912

TRAY FOR GAS AND LIQUID CONTACT TOWER

Vlastimil Braun, and Otto Vitek, both of Brno, Czechoslovakia, assignors to Kralovoposlka Strojirna Zavody chemickych zarizehi Klementa Gottwald, norodni podnik, Brno, Czechoslovakia

Continuation-in-part of application Ser. No. 464,982, June 18, 1965, now abandoned. This application Jan. 31, 1969, Ser. No. 795,474
Int. Cl. B01f *3/04*
U.S. Cl. 261—114 VT **7 Claims**



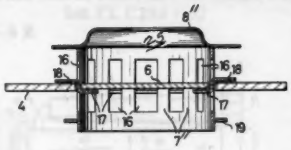
A tray for gas or vapor and liquid contact towers has elongated slots. An elongated cap covers either a single slot or two or more aligned slots. The caps have a rooflike profile or any suitable curved configuration. Each cap is provided with a longitudinally extending single row of longitudinally spaced depending members each of which extends transversely of the respective cap and downwardly through the respective slot. There is an abutment means on the depending members to limit the upward movement of the cap.

3,618,913

FRACTIONATING COLUMNS

Arno Schramm, Mannheim, Germany, assignor to Stahl Apparate-Und Geratebau G.m.b.H., Viernhein am Hessen, Germany

Filed May 16, 1969, Ser. No. 825,233
Int. Cl. B01d *3/20*
U.S. Cl. 261—114 VT **14 Claims**



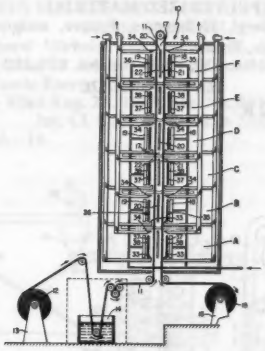
An intermediate plate of a fractionating column includes shutters vertically movable in support members, which latter are vertically movable in the bottom apertures of the plate. The support members have openings therein for the passage of the lighter medium.

3,618,914

APPARATUS FOR PROCESSING TEXTILE CORD

Willie H. Best, Columbia, S.C., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 15, 1970, Ser. No. 46,050
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 **20 Claims**

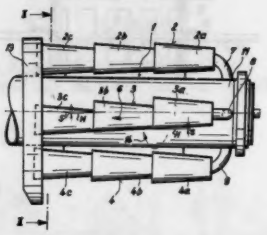


An apparatus for treating or processing textile cord, especially cords suitable for reinforcing pneumatic tires. The apparatus has a number of vertically stacked and spaced gas-fired burners with exposed flames for emitting infrared radiation. A continuous textile cord, or sheet of textile cord fabric is moved through the apparatus in heat-receiving relation past the exposed flame of burners. A screen or shield with adjustable openings is interposed between the moving cord and each burner for regulating the infrared radiation impinged on the cord. A sensor, responsive to the temperature of the cord, is utilized for changing the size of the openings of the shield to control the environment or heat conditions in which the cord is processed.

3,618,915
ROTARY FURNACE

Otto Heinemann, Ennigerloh, and Werner Schobler, Ahler, both of Germany, assignors to Polysium AG, Neubeckum, Germany

Filed July 17, 1970, Ser. No. 55,634
Claims priority, application Germany, Aug. 22, 1969, P 19 42 840.1
Int. Cl. F27b 7/38
U.S. Cl. 263—32 C 8 Claims

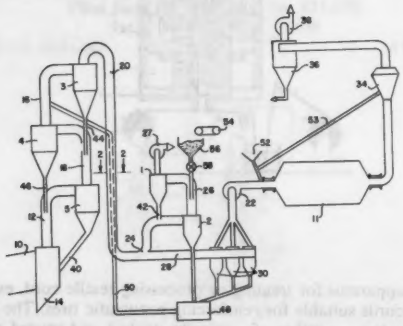


A rotary tubular furnace having a cooling zone comprising an array of passages for conveying the furnace charge to a discharge station. The passages are disposed around the furnace and extend generally parallel to its axis from the furnace discharge end. Conical sections oriented with axes generally parallel and offset from each other are coupled in tandem to form passages which retard the issuance of the charge and enhance its cooling.

3,618,916
APPARATUS FOR PREHEATING SEPARATORS FOR PULVERIZED MATERIAL

Jean Claude Giorgi, Hellemmes, France, assignor to Fives Lille-Cail, Paris, France

Filed Nov. 20, 1969, Ser. No. 878,310
Int. Cl. F27b 7/20
U.S. Cl. 263—32 R 5 Claims

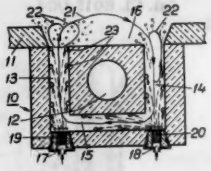


Apparatus for preheating pulverized material in the manufacture of cement includes a plurality of cyclone separators at least two of which are vertically spaced from each other. Air is passed between the separators in one direction and the particulate material is pneumatically conveyed in the opposite direction through a tube located within the air conduit.

3,618,917
CHANNEL-TYPE INDUCTION FURNACE

Bengt Fredrikson, Vasteras; Sven Helsing, Finspong, and Kare Folgero, Vasteras, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 9, 1970, Ser. No. 9,705
Claims priority, application Sweden, Feb. 20, 1969, 2340/69
Int. Cl. C21c 7/00
U.S. Cl. 266—34 A 9 Claims

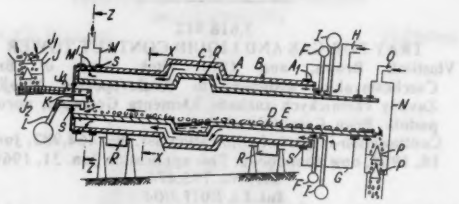


A channel-type induction furnace has one or more inductors, a bottom channel beneath the inductor or inductors and side channels connecting the bottom channel to the hearth. In the case of more than one inductor, there is also at least one central channel running between the inductors. Nozzles are provided openings into the bottom channel opposite the side and central channels for the supply of inert and/or active gas into the channels to modify the flow therein and to carry to the top of the melt various impurities.

3,618,918
ROTARY KILN FOR CONTINUOUS HEATING OF MATERIAL WITHOUT CONTACT WITH HEATING GASES

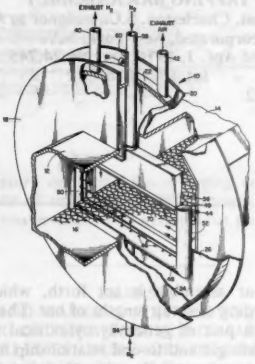
Madhusudan Raghunath Tembe, c/o Tembe Industries Tembe's Bungalow, Sykes Extension P.O. Shakapuri, Kolhapur, India

Filed Sept. 29, 1969, Ser. No. 861,876
Claims priority, application Great Britain, Nov. 28, 1968, 56,566/68
Int. Cl. F27b 7/08
U.S. Cl. 263—34 3 Claims



A rotary kiln for the continuous carbonization of coal is formed of a longitudinally extending inner shell surrounded by a longitudinally extending outer shell so that heating-gas passages extending the longitudinal direction of the kiln about the inner shell. Within the inner shell, intermediate the charging end and discharging end of the kiln, a cavity or pool is provided for holding the coal in a liquid state for a required period of time during its travel through the kiln. At the discharge end the inner shell extends longitudinally beyond the outer shell and a stationary firing chamber is provided at the end of the outer shell so that it is spaced from the discharge end. At the charging end of the kiln, a fixed chimney hood is arranged in communication with the heating-gas passages about the inner shell. By sealing the interior of the inner shell from the heating-gas passages and also from the atmosphere, the coal can be continuously carbonized without being contacted by the heating-gas or the atmosphere.

3,618,919
ADJUSTABLE HEAT AND GAS BARRIER
Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, Waltham, Mass.
Filed Nov. 3, 1969, Ser. No. 874,093
Int. Cl. F27b *5/02*
U.S. Cl. 263—37 7 Claims

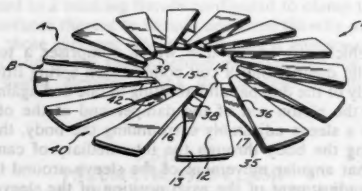


A heat and gas barrier for a muffle furnace having a gas gate adjustable to selected heights within the muffle and effective to controllably isolate the respective gas atmospheres of adjacent muffle zones.

3,618,920
THERMAL PROCESSING TO IMPROVE THERMAL STRESS RESISTANCE
Jack R. Bohn, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Mar. 16, 1970, Ser. No. 20,152
Int. Cl. F27b *19/04*
U.S. Cl. 263—52 3 Claims

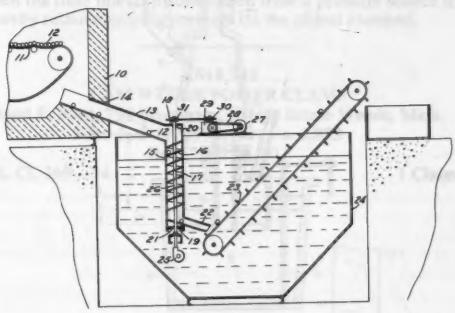
Tensile thermal stress failure can be avoided by inducing favorable residual stresses which oppose thermal stresses encountered in the duty cycle. Favorable residual stresses are induced by heating an object to ductile temperature, applying a heat flux to localized areas of the object, and cooling so as to retain thermal stresses.

3,618,921
DIFFUSER PLATE
Robert Lee Corbett, Jr., 22732 Westlake Road, Rocky River, Ohio
Filed June 15, 1970, Ser. No. 46,407
Int. Cl. C21d *1/00*
U.S. Cl. 226—5 R 7 Claims



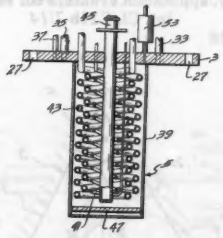
There is disclosed herein a diffuser plate for separating coils of sheet metal stacked on a vertical axis in an annealing furnace, the plate comprising two superimposed layers of flat bars, the bars in one layer being straight with tapered edges and uniformly skewed with respect to true radii of the plate and the bars in the other layer being tapered and curved in a circumferential direction opposite to the slant of the bars in the first layer and overlapping said bars in said first layer.

3,618,922
METHOD AND MACHINE FOR HEAT TREATING METAL BALLS
Roland C. Crans, Detroit, Mich., assignor to Holcroft & Company, Livonia, Mich.
Filed Dec. 8, 1969, Ser. No. 882,814
Int. Cl. C21d *1/62*
U.S. Cl. 266—6 R 10 Claims



Apparatus for hardening metal balls consisting of a spiral track within a quenching medium through which the heated balls move downwardly by gravitation thereby subjecting them to uniform quenching action. The speed of quenching is varied by rotating the spiral track and by moving the quenching medium relative to the track by a pump.

3,618,923
APPARATUS FOR THE DISTILLATION OF POLONIUM FROM BISMUTH
Lloyd Richard Michels, San Jose, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Aug. 25, 1969, Ser. No. 852,565
Int. Cl. C21c *5/38*; C22b *7/00*
U.S. Cl. 266—16 4 Claims

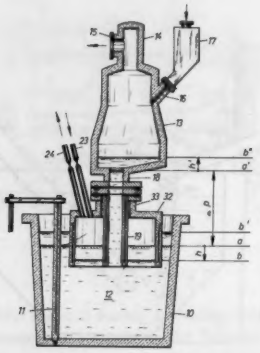


Polonium is distilled from bismuth under vacuum in a pot provided with a cover carrying a condenser which is positioned inside the pot. The condenser is filled with a liquid metal heat transfer medium in which heating elements and cooling elements are immersed. During distillation, the condenser is cooled and polonium freezes on it. The vacuum is then broken and the cover, with the attached condenser, is removed and carried to a receptacle, which may be another still pot. The condenser is then heated, melting the polonium. The polonium may be redistilled any desired number of times and further purified by chemical separation and/or solvent extraction. The apparatus may be used for the distillation of other metals.

3,618,924
METHOD AND APPARATUS FOR DEGASSING LIQUID STEEL

Theodor Messing, Mulheim, Germany, assignor to Standard-Messo Duisburg Gesellschaft fur Chemietechnik mit beschrankter Haftung & Co., Duisburg, Germany

Filed Oct. 23, 1968, Ser. No. 769,793
Claims priority, application Germany, Oct. 24, 1967, P 15 83 294.7
Int. Cl. C21c 7/10
U.S. Cl. 266—34 V 3 Claims

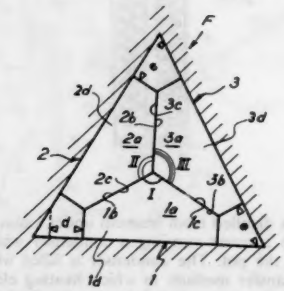


A method of and device for degasifying liquid steel batch by batch by vacuum treatment in a gas extraction chamber filled with a suction intake pipe extending down into a ladle containing the liquid steel to be degasified, according to which while holding said ladle and said gas extraction chamber stationary, displacing a batch of molten steel from said ladle into said degasifying gas extraction chamber, degasifying said last-mentioned batch in said gas extraction chamber and releasing the degasified batch from said chamber.

3,618,925
ADJUSTABLE CLOSURE FOR OUTLETS IN RECEPTACLES FOR MOLTEN METAL OR THE LIKE

Bernard Girolami, Metz-Borny, France, assignor to Institut De Recherches De La Siderugie Francaise, Saint Germain-en-Laye, Yvelines, France

Filed Feb. 13, 1970, Ser. No. 11,232
Claims priority, application France, Feb. 14, 1969, 6903584
Int. Cl. C21b 7/14
U.S. Cl. 266—38 16 Claims



A closure for outlets in receptacles for molten metal wherein a frame having sides which form a regular polygon accommodates a set of coplanar vanes, one for each side of the frame. The vanes comprise identical triangular portions bounded by edge faces each of which abuts against one edge face of the adjoining vane. The apices of all triangular portions abut against each other in outlet-closing positions of the vanes, and the vanes are movable from such closing positions along the respective sides of the frame, in the same direction and through identical distances, whereby their triangular portions define a polygonal passage for outflow of molten metal. The center of such passage coincides with the center of the frame.

3,618,926
TAPPING BAR ASSEMBLY

William J. Bernat, Charleston, S.C., assignor to Air Reduction Company, Incorporated, New York, N.Y.

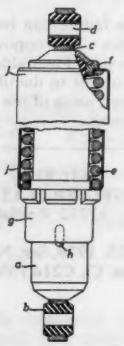
Filed Apr. 1, 1970, Ser. No. 24,745
Int. Cl. C21b 7/12
U.S. Cl. 266—42 8 Claims

A tapping bar assembly is set forth, which serves to eliminate discarding of scrap lengths of bar. The assembly includes at least a pair of generally cylindrical tapping bars, which are held in rigid end-to-end relationship by a consumable metallic sleeve surrounding the adjoining bar ends and crimped thereabout.

3,618,927
VEHICLE SUSPENSION UNITS

Lawrence George Nicholls, Tyseley, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 25, 1969, Ser. No. 819,390
Claims priority, application Great Britain, Apr. 26, 1968, 20068/68
Int. Cl. F16f 13/00
U.S. Cl. 267—8 2 Claims



A vehicle suspension unit which comprises a telescopic hydraulic damper and a coil compression spring fitting over the body of the damper and abutting at one end against a collar on the piston rod of the damper and at the other end against a sleeve adjustably surrounding the body, the sleeve engaging the body through the intermediary of cam means such that angular movement of the sleeve around the body causes adjustment of the axial position of the sleeve on the body, the cam means positively locating the ring in at least two different positions of adjustment, mainly characterized in that the sleeve comprises an inner portion (4) whose end face is shaped to constitute a cam surface (7) engaging projections (*h*) on the body of the damper and an outer portion (3) surrounding the inner portion and projecting axially beyond the shaped end face thereof.

3,618,928

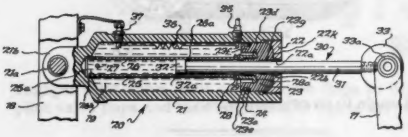
RESILIENT CYLINDER LIQUID SPRING

Paul H. Taylor, 3877 East River Road, Grand Island, N.Y.

Continuation of application Ser. No. 619,531, Feb. 27, 1967, now abandoned. This application Aug. 14, 1969, Ser. No. 850,269

Int. Cl. B60g *13/08*; F16f *5/00, 9/10*

U.S. Cl. 267—65 5 Claims



A low pressure operating liquid spring and/or shock absorber capable of operating under varying impact loads is provided for use in suspension systems for passenger vehicles and the like.

3,618,929

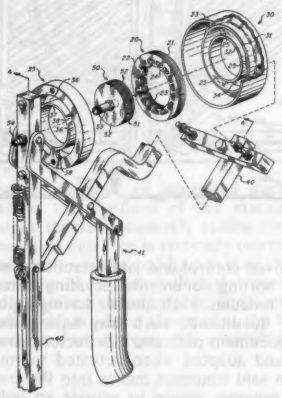
HOLDING AND MASKING FIXTURE FOR APPLYING A COATING OF THERMOSETTING MATERIAL TO SELECTED SURFACES OF A PART

Harold R. Upchurch, Durham, N.C., assignor to Sperry Rand Corporation

Filed Apr. 3, 1969, Ser. No. 813,001

Int. Cl. B25b *1/04*; B44d *1/095*

U.S. Cl. 269—6 4 Claims



A holding and masking fixture for hand use in the fluidized bed method of applying a coating of thermosetting material to selected surfaces of relatively small parts. The heated part is mounted in a masking fixture configured to clamp the part by the surfaces thereof to remain uncoated thereby precisely masking those surfaces. The masked part is immersed into a powder cloud of the thermosetting material, and the coated part is baked thereby curing the adhered thermosetting material.

3,618,930

PNEUMATIC PIPE CLAMP

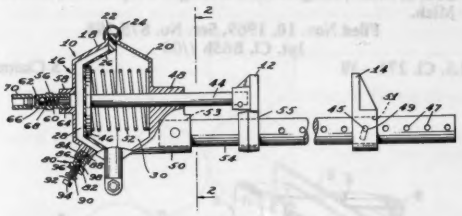
James C. Brandt, 3153 Stelling Road, and Paul A. Brandt, 240 Colorado St., both of Palo Alto, Calif.

Filed Dec. 18, 1968, Ser. No. 784,813

Int. Cl. B25b *5/02*

U.S. Cl. 269—20 1 Claim

A portable clamp in which one of the clamping jaws is operated by a diaphragm-type fluid actuator, having valve means for automatically closing the fluid inlet to the actuator when the fluid inlet is disconnected from a pressure source to thereby retain clamping pressure on the object clamped.



3,618,931

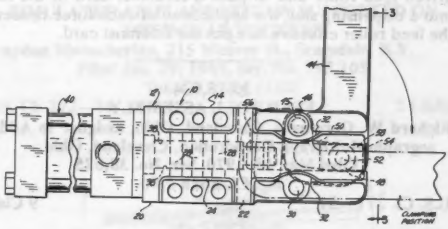
CAM WEDGE POWER CLAMP

Leland F. Blatt, 790 Shoreham, Grosse Pointe Woods, Mich.

Filed Jan. 19, 1970, Ser. No. 3,853

Int. Cl. B23g *3/02*

U.S. Cl. 269—94 1 Claim



A power-actuated clamp used for holding workpieces in a fixed position having reversible parts for simplified construction.

3,618,932

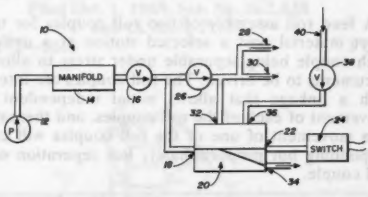
DOCUMENT FEEDER CONTROL SYSTEM

Victor M. Moreland, and Ernest L. Staples, Jr., both of Dallas, Tex., assignors to Recognition Equipment Inc., Dallas, Tex.

Filed Sept. 22, 1969, Ser. No. 859,700

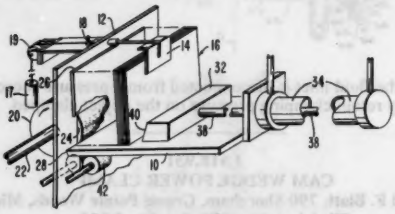
Int. Cl. B65h *7/02*; F15c *1/10*

U.S. Cl. 271—26 9 Claims



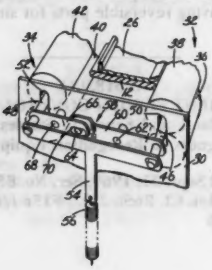
A control system for document feeders of the type having a document advancing paddle includes a fluidic OR gate and a pressure-sensitive switch. The OR gate normally activates the switch which in turn connects operating power to a paddle advancing motor. The OR gate includes control ports that are coupled to the faceplate and bottom plate ducts in the feeder. Whenever one of the ducts is blocked, the OR gate deactivates the switch and thereby stops the operation of the paddle.

3,618,933
CARD FEED DEVICE
Edwin O. Roggenstein, Birmingham, and Earl Olsen, Detroit, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Nov. 10, 1969, Ser. No. 875,298
Int. Cl. B65h 1/08
U.S. Cl. 271—39 5 Claims



A mechanism for feeding cards singly from a stack of cards where the feeding is initiated by intermittent forces applied to the stack, each force operating to press the stack against a driven feed roller and to push a foremost card of the stack into a dispensing slot, the application of each force rendering the feed roller effective to eject the foremost card.

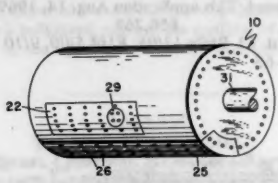
3,618,934
FEED ROLL ASSEMBLY
Richard W. Germuska, Cleveland, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed May 18, 1970, Ser. No. 38,025
Int. Cl. B65h 5/06
U.S. Cl. 271—51 9 Claims



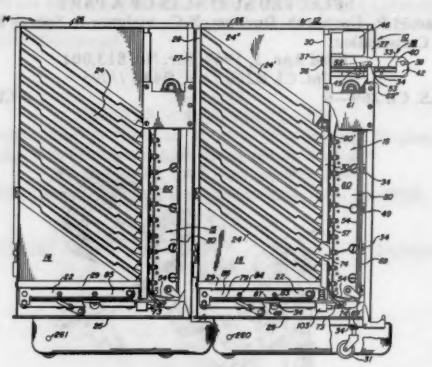
A feed roll assembly of two roll couples for transporting sheet material past a selected station at a uniform speed, each couple being separable under stress to allow for thick documents to be driven. The roll couples are interconnected with a linkage that allows initial independent separation movement of each of the roll couples, and thereafter separation movement of one of the roll couples will cause a corresponding but proportionately less separation of the other roll couple.

3,618,935
TRANSFER APPARATUS FOR A SMALL PIECE OF SHEET MATERIAL
George F. Howatt, Holden, Mass., assignor to New England Envelope Manufacturing Company, Worcester, Mass.
Filed June 23, 1969, Ser. No. 835,697
Int. Cl. B65h 5/06, 5/08
U.S. Cl. 271—51 3 Claims

The present invention relates to an article transfer apparatus and, more particularly, to a roller for moving a sheet of paperlike material and, at the same time, turning it at a substantial angle to its original aspect.



3,618,936
JAM DETECTION SYSTEM FOR SORTING APPARATUS
Richard T. Ziehm, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Oct. 31, 1969, Ser. No. 872,812
Int. Cl. B65h 29/58
U.S. Cl. 271—64 2 Claims

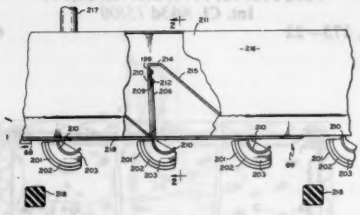


An improved control and jam detection system for an apparatus for sorting documents including transport means, a plurality of modules, each module having a plurality of trays for storing documents, each tray having an inlet located along the document path and a deflector member associated therewith and adapted when actuated to route said documents from said transport means into the tray. The system comprises program means to actuate an individual one of said deflector members to route said documents into a selected tray in predetermined sequence, sensing means for sensing presence and absence of a document at predetermined locations along said document feed path and providing corresponding presence and absence indicating signals, and circuit means coupled to said transport means including a timing means responsive to said signals and providing an input to control the transport means whereby upon the occurrence of a jam the transport of documents into each of the modules is stopped and the document input supplied to an overflow tray until another signal from said program means is received at which time the apparatus is shutdown.

3,618,937
VACUUM CONVEYOR
William E. Follett, P.O. Box 608, Beaverton, Oreg.
Filed July 25, 1968, Ser. No. 747,605
Int. Cl. B65h 29/32
U.S. Cl. 271—74 3 Claims

A vacuum conveyor having a plenum chamber has a zigzag bottom with planar walls having openings which are normally

closed by sheetlike main flaps. The leading edge of a sheet

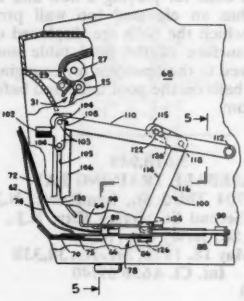


engages pilot valve flaps on the main flaps to first open the pilot valve flaps and then engages and opens the main flaps.

3,618,938
DOCUMENT-STACKING DEVICE FOR PHOTOCOPYING MACHINES

Phillip Pollak, Jr., Westport; Douglas I. Morrison, Norwalk, and William A. Ross, Darien, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 15, 1969, Ser. No. 884,945
Int. Cl. B65h *31/20*
U.S. Cl. 271—86 **11 Claims**



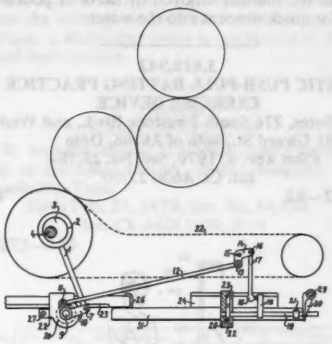
In a photocopy machine, an integrated stacking chute is positioned within the confines of the machine frame to receive and stack sheets successively exiting from a machine feed path. The chute entrance is vertically oriented, while the chute terminal portion is defined by a pair of closely spaced, horizontal members. A backstop slidingly received between the horizontal members is adjustably positioned such that when the leading edges of the sheets abut the backstop, the trailing edges thereof are conveniently accessible at the chute entrance.

3,618,939
MECHANISM FOR ORIENTING PAPER SHEETS

Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to Adamovske Strojirny, narodni podnik, Adamov, Czechoslovakia

Filed Feb. 24, 1969, Ser. No. 802,335
Claims priority, application Czechoslovakia, Feb. 23, 1968, 1390/68
Int. Cl. B65h *31/34*
U.S. Cl. 271—89 **7 Claims**

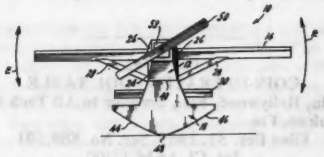
In a mechanism adapted to be used, for instance, with installations such as printing presses in order to provide for proper orientation of stacked sheets, the sheets are stacked on a table and at one end the sheets are located against a given stop structure. A shifting structure coacts with the opposed end of the sheets to shift them into engagement with the stop structure. In addition, a pair of opposed side-edge-shifting structures are provided for engaging the opposed side edges of the sheets so as to properly position them laterally. A single drive is provided to coact with the end-shifting structure while a transmission extends therefrom to the pair of opposed side edge shifting structures so that in this way the drive is transmitted to all of the shifting structures. In the drive, there is a friction type of transmission giving the possibility of adjusting the several shifting structures even while the mechanism operates.



3,618,940
SIMULATED AIRPLANE SEESAW SUPPORTED ON DISSIMILAR ROCKERS

Fraydun Manocherian, 215 Weaver St., Scarsdale, N.Y.

Filed Jan. 29, 1969, Ser. No. 795,105
Int. Cl. A63g *11/00*
U.S. Cl. 272—56 **2 Claims**

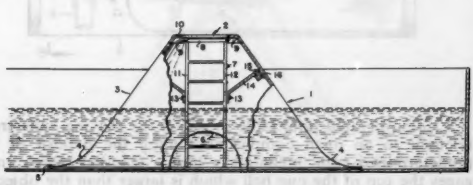


A child's seesaw is constructed in the form of a simulated airplane having a fuselage section mounted for side-to-side rocking movement and wing and tail sections adapted to provide seat locations for two to four children. "Two dissimilar rockers mounted transversely of the fuselage support the seesaw."

3,618,941
AMUSEMENT SLIDE

Benjamin G. Haynes, 1607 W. Clay St., and Ronald H. Schulson, Rt. #1, Box 264, both of Dallas, Oreg.

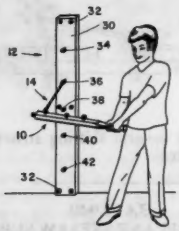
Filed Oct. 1, 1969, Ser. No. 862,838
Int. Cl. A63g *21/18*
U.S. Cl. 272—56.5 **1 Claim**



A hollow frustoconical shell whose sides merge on a radius of curvature into a flanged annular base and adapted for use above ground or partially submerged in wafer. The wall of the shell is provided with a downwardly opening entrance to provide a user with access to the interior of the shell and to a

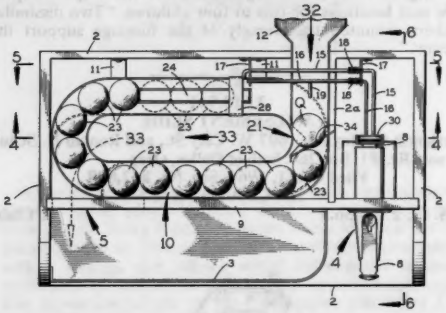
vertically disposed ladder terminating at the opening provided by the frustum of the shell. Upon reaching the top of the ladder a user makes his exit through the open frustum into a position for sliding down the wall of the shell somewhat in the manner enjoyed by users of pool-side slide apparatus for quick descent into the water.

3,618,942
AN ELASTIC PUSH-PULL BATTING PRACTICE TYPE EXERCISE DEVICE
Robert H. Bates, 276 South Firestone Blvd., and Wesley Klipstein, 1381 Girard St., both of Akron, Ohio
Filed Apr. 6, 1970, Ser. No. 25,784
Int. Cl. A63b *23/00*
U.S. Cl. 272—82 **4 Claims**



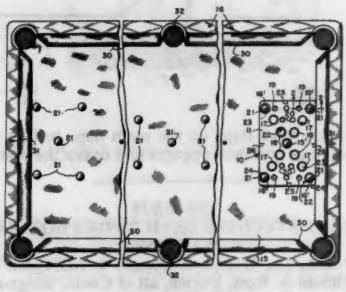
A device for exercising and strengthening the wrists. The device consists of a bat or club, an anchor board which is securely fastened to a wall or column, and a length of a strong elastic rope or band which is attached at one end to any one of a number of points on the anchor board and at the other end to any one of a number of points on the bat or club.

3,618,943
COIN-OPERATED POOL TABLE
Ernest Milu, Hollywood, Fla., assignor to All Tech Industries, Inc., Hialeah, Fla.
Filed Dec. 31, 1969, Ser. No. 889,501
Int. Cl. A63d *15/00*
U.S. Cl. 273—11 C **1 Claim**



A coin-operated pool table in which the playing balls are released to an open compartment upon the deposit of a predetermined coin, including a bridge member which engages the top of the cue ball which is larger than the object balls for the automatic release and return of the cue ball into the compartment during the play of the game. As the object balls are hit into the table pockets, they are guided down a common helical runway where they are sequentially retained by a hinged spring biased platform and a stop member secured over said runway until said platform is released by a coin-actuated lever.

3,618,944
POOL BALL RACK
James H. Myers, 2406 Dalewood Drive, Silver Spring, Md.
Filed Feb. 12, 1970, Ser. No. 10,741
Int. Cl. A63d *15/00*
U.S. Cl. 273—22 **6 Claims**



A ball rack for use with pool or pocket billiard tables for locating the object balls in predetermined spread relation to one another on different areas of a pool table to facilitate locating the object balls for playing a new and unique pool game. The rack has an elevated top wall provided with openings through which the balls are displaced downwardly onto the playing surface of the pool table and including resilient rings secured to the openings for engaging and accurately locating the balls on the pool table and before removal of the rack therefrom.

3,618,945
BASEBALL TRAINING BAT
William Kuchar, 704 Third St., Lyndhurst, N.J.; Anthony Nicodemo, 402 Second St., Jersey City, N.J., and Joseph Pope, 51 Spruce St., Jersey City, N.J.
Filed May 18, 1970, Ser. No. 38,338
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 B **8 Claims**

A baseball bat in which the areas of the bat above and below the preferred hitting area are formed with cushioning material to train a player to hit the ball with the delineated preferred hitting area of the bat and to protect the bat from splitting when the ball is hit with the cushioned areas.

3,618,946
INSERT FOR FOOTBALL KICKING SHOE
Ryals E. Lee, 420 Plantation Road, Tallahassee, Fla., and Paul W. Lee, 1606 Marshall St., Waycross, Ga.
Filed May 28, 1969, Ser. No. 828,792
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 B **1 Claim**

Apparatus molded to the shape of an individual's foot and

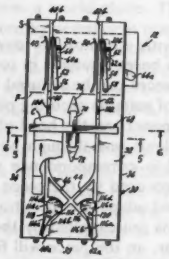
insertable within a football shoe to prevent bending of the ankle when a football is placekicked.

3,618,947

START-FINISH MECHANISM FOR RACING GAME

Julius Cooper, New Hyde Park, and Erwin Benkoe, Manhasset Hills, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,437
Int. Cl. A63f 9/14
U.S. Cl. 273—86 R 15 Claims



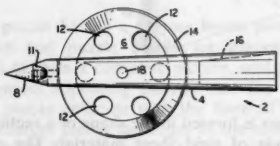
A starting and finishing gate for use in a racing game which includes a racing course having first and second racing lanes. The gate includes first and second gate members which are arranged in relation to the first and second racing lanes to move between lane blocking positions and lane clearing positions. In the lane blocking positions, the gate members establish a starting line for the cars and when moved to the lane clearing position, the cars are permitted to travel about the racing course. The gate also includes a finish indicator having first and second signals arranged to indicate the arrival at a finish line of one of the cars on one of the racing lanes.

3,618,948

ARROWHEAD WITH ROTATABLE CUTTING BLADE

Walter L. McGlocklin, R.R. #2, Bloomington, Ind.

Filed June 27, 1969, Ser. No. 837,142
Int. Cl. F41b 5/02
U.S. Cl. 273—106.5 B 2 Claims



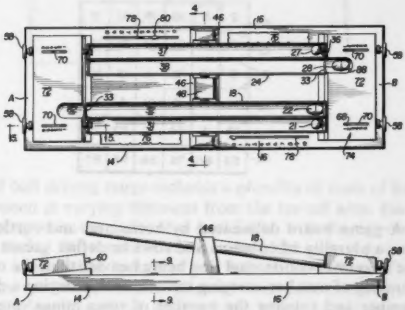
A hunting arrowhead formed from a ferrule body section and having a circular cutting member which is rotatably mounted therein. The circular cutting member is positioned in an elongated slot formed in the ferrule body section. The elongated slot can be centrally located in said body section or it can be disposed forwardly thereof so that the member projects beyond the end of the body section. When the slot and hence the cutting member are centrally located in said body section, a multisided point is positioned at the forward end of said body section.

3,618,949

GAME APPARATUS

William R. McLain; Daniel F. Krause, and Charles H. Hardin, all of Davidson County, Tenn., assignors to Kusan, Inc., Nashville, Tenn.

Filed Feb. 27, 1970, Ser. No. 14,975
Int. Cl. A63f 9/00, 9/14
U.S. Cl. 273—110 14 Claims



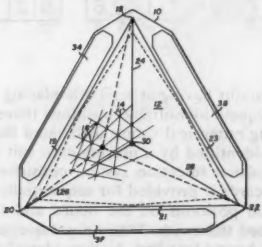
A game apparatus for players comprising a pair of identical seesaw members pivotally mounted centrally of an elongated base with each of the members being provided with a pair of longitudinally extending tracks, one track opening onto a "win" pocket for a ball-containing capsule and one track for a steel ball. Two steel ball spring projectors are mounted on each end of the base in alignment with and projecting within the two ends of the steel ball tracks and are operative to strike and project the balls to the opposite ends of the tracks to effect tilting of the tracks by their weight and resultant gravity movement of the capsules toward and into the "win" pockets.

3,618,950

GAME IN WHICH MOVEMENT OF PEG CAUSES BOARD AREAS TO CHANGE

Kenneth Chew, Santa Clara, Calif.

Filed Dec. 12, 1969, Ser. No. 884,410
Int. Cl. A63f 9/00
U.S. Cl. 273—134 AE 1 Claim



A generally triangular shaped game board having three sets of lines disposed on the surface thereof with each set of lines radiating from different apices of an equilateral triangle and intersecting the other sets of lines at a plurality of points over the surface of the game board. Holes are provided at the in-

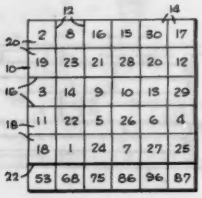
tersection of the lines and a peg is provided for being positioned in any of the plurality of holes. Three strings are respectively connected between the peg and the three vertices of the triangle so that movement of a peg from one hole to another causes the three areas defined by the strings and the sides of the triangle to be changed simultaneously each time the peg is moved to a new location.

3,618,951

APPARATUS FOR PLAYING A BINGOLIKE GAME

Gerald H. Parrick, III, 5424 Corteen Pl., Apt. 26, and Gerald G. Clodfelter, 4657 Kraft Ave., both of North Hollywood, Calif.

Filed June 11, 1969, Ser. No. 832,409
Int. Cl. A63f 3/00
U.S. Cl. 273—135 B **15 Claims**



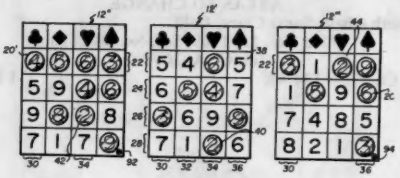
A game board delineated by horizontal and vertical lines into a plurality of columns and rows to define vacant spaces, the lowermost horizontal line being heavier than the others, a plurality of number-carrying tokens, each carrying a different number and totaling the number of rows minus one on the game board times the number of columns on the game board, and a random number selector having a plurality of different numbers thereon, with the lowest number being larger than the highest number on the number tokens. In species for plural players, a plurality of game boards overlap so that some of the spaces on the board of one player are in common with spaces on the board of another player.

3,618,952

GAME UTILIZING MATHEMATICAL BASE SYSTEMS

Ronald J. Tallarida, Willingboro, N.J., assignor to University Creations, Inc., Cherry Hill, N.J.

Filed Sept. 8, 1969, Ser. No. 856,061
Int. Cl. A63f 3/00; G09b 19/02; G06c 27/00
U.S. Cl. 273—135 B **23 Claims**



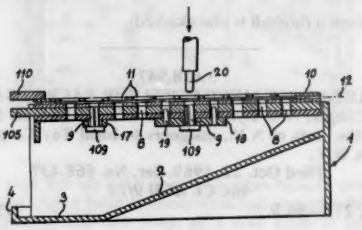
A game apparatus having at least one playing board having an array of uniquely identifiable positions thereon with such positions having numerical values associated therewith, each position being identified by a playing card suit symbol and a numeral. A position selection system consisting of conventional playing cards is provided for sequentially identifying a plurality of said positions on the board and the numerical values associated therewith. When a preselected number of positions have been identified, further identification ceases; and a base selection card is chosen for selecting the particular mathematical base system on which continued play of the game is to be predicated. Once the base system is chosen, those identified numerical values which have mathematical significance in the particular base system chosen are converted to numerical values in another base system, preferably base 10, and the total of these converted numerical values is determined to represent the score of the player. A particular aspect of the apparatus resides in the disc-type converter which is of simple, compact construction and so designed to facilitate direct conversion of one numerical base system to another.

3,618,953

CHECKERBOARD GAME DEVICE

Sergio Lanza, 14 R, Via Groberti, Lavagnola, Italy

Filed July 20, 1970, Ser. No. 56,449
Claims priority, application Italy, Aug. 8, 1969, 7239-A/69
Int. Cl. A63f 3/00
U.S. Cl. 273—130 D **9 Claims**



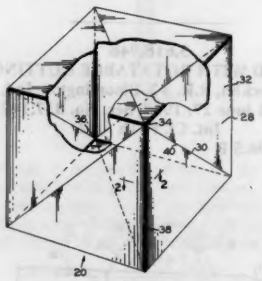
A box provided with a removable cover panel, which is formed with through bores arranged in rows as in a checkerboard. Removable pieces can be secured to the underside of the panel by means of suitable securing pins so that the piece is held between the panel and the head of the pin. The piece is provided with at least one through bore for the securing pin and is provided in correspondence with the remaining bores of the panel covered by the piece itself with pins integral to the piece and adapted to penetrate partially into the panel bores. The pins are expelled by the action of a stylus operate by the player, an the piece will fall off whenever all securing pins, or just one integral pin, has been expelled. The player will direct his hits without knowing the position of the pieces. To this respect the checkerboard may be covered by a suitable opaque and perforable sheet.

3,618,954

PUZZLE BOX

Stephen S. Murff, Eugene, Oreg., assignor to Scientific Demonstrators, Inc., Eugene, Oreg.

Filed Sept. 4, 1970, Ser. No. 69,856
Int. Cl. A63f 9/08
U.S. Cl. 273—155 **10 Claims**



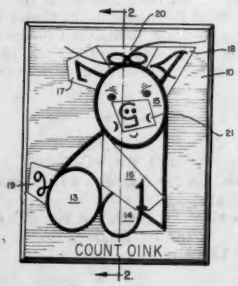
A puzzle box is formed in the shape of a rectangular parallelepiped made of rigid sheet material. The edges of the parallelepiped are hingedly connected together, but the faces thereof are each slit along one diagonal. Three of the slit diagonals meet at one corner of the parallelepiped, while the other three slit diagonals meet at the opposite corner. The

resulting structure may be turned inside out as well as foldably transformed into a variety of configurations.

3,618,955
METHOD OF MAKING AN EARTH PUZZLE
Bette Abell Barnes, 1210 Sheridan Lane, Beaumont, Tex.
Filed Mar. 3, 1970, Ser. No. 15,995
Int. Cl. A63f 9/12; G09b 27/08
U.S. Cl. 273—157 R 4 Claims

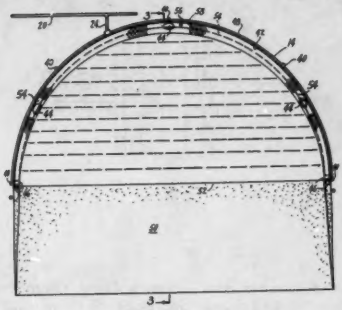
An earth puzzle including sphere formed of magnetizable material and a plurality of puzzle pieces which may be placed on the sphere to form a world globe. The puzzle pieces are retained on the sphere by permanent magnets attached to the underside of the puzzle pieces. In making the aforementioned structure, the sphere is first fabricated from magnetizable material. A second sphere is molded on the first sphere after which a representation of the world is painted or otherwise placed on the second sphere. The second sphere is then cut into puzzle pieces and removed from the first sphere. Permanent magnets are then suitably attached to the underside of the puzzle pieces which may then be placed on the first sphere to form a world globe with the permanent magnets retaining the pieces on the first sphere.

3,618,956
NUMERAL STUDY PUZZLE
Robert J. Biederer, 507 North Wisner, Park Ridge, Ill.
Filed Aug. 28, 1969, Ser. No. 853,732
Int. Cl. A63f 9/10; G09b 19/02
U.S. Cl. 273—157 R 1 Claim



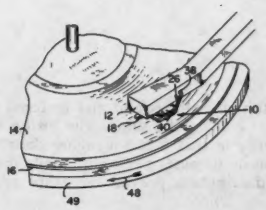
A picture puzzle having a playing board provided with a recessed area and puzzle pieces for placement in said recessed area to form a complete picture, said puzzle pieces having a numeral appearing thereon and the periphery of some of the pieces coincide with the form of the numeral along edges thereof facing the edges of the recessed area in the playing board. The numerals on other pieces define features of the creature or object depicted in the picture. The shapes of the pieces are not as irregular as the shapes of the numerals disposed on the pieces.

3,618,957
GOLF GAME
Thomas R. Cain, 5265 California Way, Paradise, Calif.
Filed June 2, 1970, Ser. No. 42,777
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 A 5 Claims



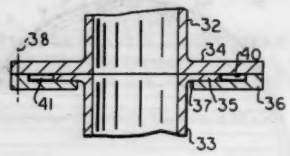
A golf ball driving range includes a plurality of rows of ball stops spaced at varying distances from the tee-off area. Each stop is shaped in the form of a semicircle, with the opening thereof facing the tee-off area. An electrical system is provided to sense when a driven golf ball enters a stop. This system may take the form of photoelectric units mounted at the front of each stop or, alternatively, electrical wires embedded in the vertical walls and inclined floor of each stop. The sensing system actuates flashing indicator lights associated with each row of stops and the lights of each row are of different colors. An inclined ball return channel is provided within each stop, adjacent the juncture of the rearwardly inclined floor thereof and the walls of the stop. A game of golf may be played by assigning a par to each row of stops and counting the number of shots required to drive a golf ball into one stop of each row.

3,618,958
PHONOGRAPH RECORD WIPER
John A. Schmidlin, West Orange, N.J., assignor to Arnet, Inc., New York, N.Y.
Filed Feb. 6, 1970, Ser. No. 9,352
Int. Cl. G11b 3/58
U.S. Cl. 274—47 4 Claims



A phonograph record wiper suspended from the phonograph arm in wiping relation with the grooved surface of a phonograph record, wherein the suspending connection permits unimpeded pivotal movement in the wiper of an extent which results in the automatic assumption by the wiper of an optimum wiping position in response to rotational movement of the phonograph record beneath the wiper.

3,618,959
LATERALLY SLIDABLE SEALED JOINT
Milan E. Gerard, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Division of Ser. No. 520,002, Jan. 11, 1966, Pat. No. 3,435,185.
Filed Aug. 16, 1968, Ser. No. 848,764
Int. Cl. F16j *15/14, 15/40;* **B65d** *53/06*
U.S. Cl. 277—1 **4 Claims**

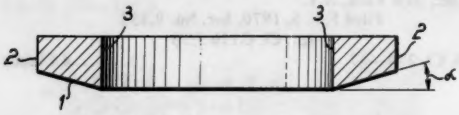


Open-ended inner and outer walking chambers have a liquid-sealed sliding connection between them, and the outer chamber has a similar liquid-sealed sliding connection with the high vacuum chamber of an electron beam gun whose beam passes through the liquid-sealed chambers to impinge upon the surface of a workpiece.

The open ends of the walking chambers have inflatable seals which, upon being inflated, move to engage the work surface in releasable locking engagement therewith. The walking chambers also have pneumatic motors and metering devices to index the chambers relative to the beam.

A walking seal system, including the pneumatic motors, metering devices, valves, and associated elements and circuitry, operates cyclically to alternately inflate the chamber end seals, evacuate the walking chambers, and actuate the indexing motors to advance the chambers relative to the beam while maintaining therewithin the required low-order vacuum environment for the beam as it moves relative to the workpiece.

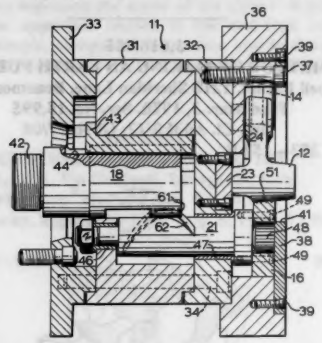
3,618,960
PISTON RING
Max Koehler, 5813 Holkenstr. 25, Wetter-Wengern, Germany
Division of Ser. No. 673,340, Oct. 6, 1967, Pat. No. 3,561,087.
Filed June 16, 1970, Ser. No. 46,617
Int. Cl. F16j *9/00*
U.S. Cl. 277—216 **4 Claims**



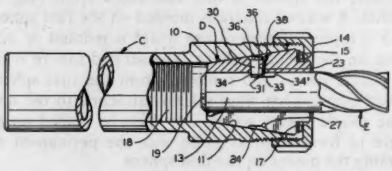
A split piston ring of pressed and sintered metal powder and method of making the same. The piston ring is characterized primarily in that it has a higher density on its inner periphery than on its outer periphery, while the same density and density distribution prevail on every radial cross-sectional plane.

3,618,961
CAM JAW CHUCK
Jozef Kiwalle, Peoria, Ill., and Frederick M. Lamb, South Bend, Ind., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 10, 1969, Ser. No. 883,959
Int. Cl. B23b *31/12*
U.S. Cl. 279—33 **5 Claims**

A chuck assembly for securing a workpiece and having a chuck body rotatably supporting cam-shaped jaw means. The cam-shaped jaw means may be rotated for variable engagement with the workpiece by linear movement of a drawbar member to secure the workpiece between the jaw means and one or more stops arranged upon the chuck body.

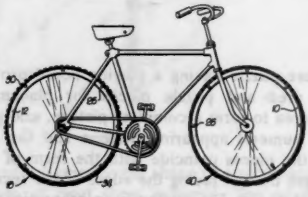


3,618,962
COLLET CHUCK
John R. Cox, Lakewood, and Joseph E. Mix, Cleveland, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio
Filed Feb. 17, 1970, Ser. No. 12,097
Int. Cl. B23b *31/10, 31/20*
U.S. Cl. 279—82 **4 Claims**



A collet chuck having a radially movable pin therein for locking a tool such as an end mill against axial withdrawal from and turning in the collet. The pin is tapered and fits within a correspondingly tapered, radially extending hole in the collet which limits its inward movement. The pin is biased into full seating engagement with the tapered hole by a retaining spring and is adapted to be cammed radially outwardly during insertion of an end mill by a beveled end on the tool shank or by the flute contour in the case of a double ended end mill. With the collet in the chuck the inner end of the pin radially overlaps a shouldered recess on the shank of the tool and the outer end contacts the inner wall of the chuck. The pin thereby prevents axial withdrawal or turning of the tool.

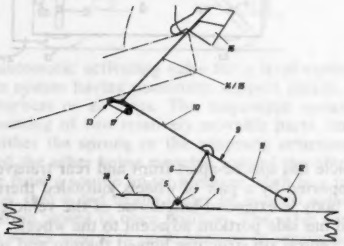
3,618,963
ICE BICYCLE
Antonio Romano, c/o Ice Capades 6121 Santa Monica Blvd, Los Angeles, Calif.
Filed Nov. 3, 1969, Ser. No. 873,613
Int. Cl. B62k *13/00*
U.S. Cl. 280—7.12 **13 Claims**



A runner band is applied over the front wheel of a bicycle. The runner band has a skate edge for movement along an ice

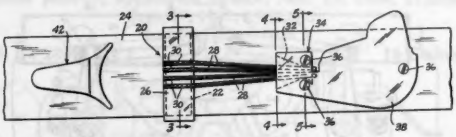
surface. A combined track and runner band is applied to the rear wheel of the bicycle, one part of the band having teeth for biting into the skate surface whereby suitable traction may be applied for propelling the bicycle. Another small part of the band is provided with skate parts. Accordingly, when it is desired to skate, the wheel is stopped at the runner part of the band.

3,618,964
REAR TIGHTENER FOR SAFETY SKI BINDINGS
Hans-Otto Frisch, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany
Filed Nov. 4, 1969, Ser. No. 873,989
Claims priority, application Germany, Mar. 7, 1969, G 69 09 236.0, May 14, 1969, P 19 24 728.0
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **6 Claims**



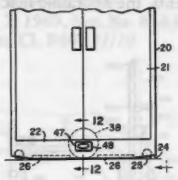
The rear tightener is pivotally held at two tension elements, which extend past the sides of the heel of the skiing boot in a downwardly inclined direction and are held on the ski by a supporting member. The latter consists of a push rod and in its central portion is pivoted to a guide lever, which is secured to the ski. The pivotal axis of both parts are parallel and extend transversely to the longitudinal axis of the ski and parallel to the tread of the ski. The arm of the push rod which extends from the pivot to the tip of the ski holds the tension elements. The other arm extending from the pivot to the rear end of the ski bears on the ski. A releasable locking device is provided, which serves to hold the push rod and/or the guide lever on the ski.

3,618,965
SAFETY DEVICE FOR SKIS
Harvard K. Hecker, 26 Black Creek Lane, St. Louis, Mo.
Filed Dec. 15, 1969, Ser. No. 885,056
Int. Cl. A63c 11/00, 9/08
U.S. Cl. 280—11.35 C **9 Claims**



A novel safety device for materially reducing friction between a ski and a skier's boot sole, particularly in the area of the ball of the foot, on release of the toe binding. One embodiment includes a Teflon tapepiece secured on a ski in the area beneath the ball of a foot for transverse pendulum engagement by the lower surface of a small stainless steel plate pivotally mounted on the ski by a plurality of stainless steel cable segments. A modification includes the stainless steel plate secured to a belting supported capable of transverse pendulum movement. A second modification includes two ball bearing discs mounted transversely of a ski in the ball of the foot area against which the ball of the foot portion of a boot is disposed.

3,618,966
MOBILE CABINET AND ANCHOR MEANS FOR SUPPORTING THE WHEELS THEREOF IN RAISED AND LOWERED POSITIONS
James R. Vandervest, Muskegon Heights, Mich., assignor to E. H. Sheldon and Company, Muskegon, Mich.
Filed July 2, 1970, Ser. No. 52,043
Int. Cl. B62d 21/14
U.S. Cl. 280—43.17 **4 Claims**



A cabinet or support structure is equipped with a pair of large wheels mounted on wheel hubs that are eccentrically supported upon an axle, the axle being rotatable to raise the wheel hubs and thereby the wheels so that the bottom of the cabinet can seat on the floor or floor carpet, and when the axle is rotated to lower the hubs, the cabinet can then be moved on the large wheels together with edge-supported casters. Means are provided for angling the wheel hubs in positions for supporting the wheels in raised and lowered positions, and means are also provided for limiting the withdrawal of the axle-rotating means.

3,618,967
BABY CAR
Genshiro Sugiyama, Tokyo, Japan, assignor to Sugiyama Manufacturing Co., Limited
Filed Mar. 9, 1970, Ser. No. 17,797
Int. Cl. B60g 1/00
U.S. Cl. 280—47.11 **3 Claims**

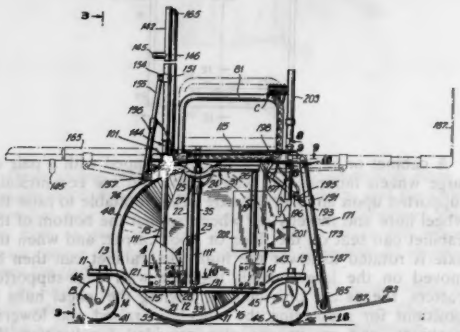
A baby carriage having caster wheels at its front end together with spring actuated mechanism for resiliently yieldably urging said wheels to a position for guiding the carriage in a rectilinear path, said mechanism being automatically yieldable in response to steering forces on the carriage to permit angular steering movement of the wheels so that they may follow a curved path of movement.

3,618,968
PATIENT-OPERATED WHEELCHAIR
Edward M. Greer, 820 Loma Vista, Beverly Hills, Calif.
Filed May 1, 1969, Ser. No. 820,980
Int. Cl. A61g 5/00
U.S. Cl. 280—47.11 **11 Claims**

A patient-operated wheelchair having improved stability and having a backrest adjustable from the vertical to infinite angles as well as a pair of footrests, each of which is independently infinitely adjustable between a lowermost position to a horizontal position so that when the backrest and both footrests are in the horizontal position, the wheelchair is converted into a stretcher. The wheelchair includes hydraulic or like-powerized controls, permitting the user adjustably to

position the various components of the wheelchair for maximum comfort and flexibility. The apparatus, in addition to convertibility from a wheelchair to a stretcher, permits heightwise adjustment of the seat, adjustment of individual leg supports and angular adjustment of the backrest. Arm rests are provided which may be deflected from the normal or vertical position to a horizontal position, facilitating sidewise movement of the patient from the wheelchair to a horizontal surface, such as a bed or massage table.

A powerized mechanism, preferably hydraulic, effects the various adjustments, the hydraulic mechanism being powered



either by a hand-operated pump or by an electrically driven pump.

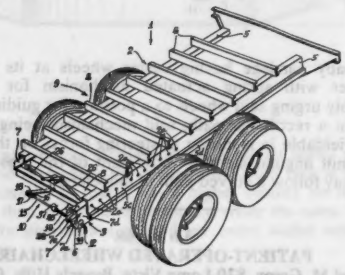
The apparatus is supported on the usual hand driven main wheels and includes front and rear sets of casters disposed at a different level than the main wheels whereby, when the wheelchair is employed in the normal phase, the weight of the device is carried by the front set of casters and the hand-driven wheels. When the apparatus is used as a stretcher, the center of gravity shifts so that the weight is carried by the rear set of casters and the handwheels. In each instance only one set of casters and the handwheels are in contact with the ground to facilitate movement.

3,618,969

APPARATUS FOR POSITIONING TRAILER SUSPENSION FRAME

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 22, 1970, Ser. No. 30,739
Int. Cl. B62d *53/06*
U.S. Cl. 280—80 B **16 Claims**



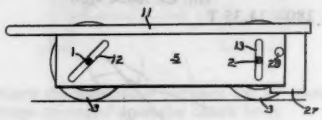
An apparatus for selectively positioning the sliding suspension frame or bogie relative to the trailer underframe including a bogie-locking assembly having handle and linkage operated spring-loaded locking pins for registering with holes in fixed suspension rails attached to the trailer underframe wherein the handle is provided with a latch pin which is held against a slotted latch plate against the action of the locking pin springs, the handle having a rotating dial, which indicates the desired amount of bogie shifting, positioned to be rotated by a star wheel driven by movement of the trailer frame relative to the bogie such that when the trailer has moved a sufficient distance, and the star wheel thereby rotated, the latch pin on the handle is allowed to pass through the slotted latch plate to permit the locking pins to engage the openings in the fixed suspension rails to prevent any further relative movement between the trailer frame and the bogie.

3,618,970

VEHICLE STEERED BY TILTING THE BODY

Darrell A. Frigaard, W. 215 Waverly Pl., Spokane, Wash.

Filed Mar. 16, 1970, Ser. No. 19,937
Int. Cl. B62b *11/00*
U.S. Cl. 280—87.01 **4 Claims**



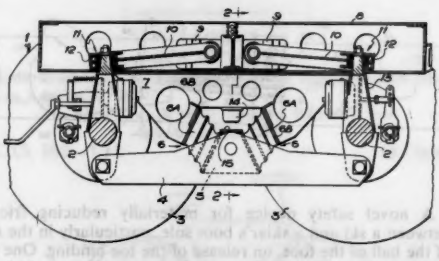
A vehicle has spaced-apart front and rear transverse axles each supported by a pair of wheels journaled thereon at its ends. A body is extended lengthwise of the vehicle over the axles and has side portions adjacent to the wheels. The body also has central rib structure hinged thereto and secured to and supported by the axles. The side portions have upright slots receiving the axles, the front pair of slots sloping forwardly from top to bottom to cause turning of the front axle upon lateral tilting of the body. The tilting of the body is opposed by resilient members connecting the rib structure to the side portions. A platform for a rider is provided on the body. A rear extension of the body behind the rear axle includes braking skids for engaging the surface beneath the vehicle upon raising of the front end of the body. The central rib structure is connected to the front axle by a member secured to the front axle and hinged to turn on an upright axis with respect to the rest of the rib structure.

3,618,971

SUSPENSION SYSTEMS FOR ROAD VEHICLES

Ronald Wragg, Sheffield, England, assignor to North Derbyshire Engineering Company Limited

Filed May 18, 1970, Ser. No. 37,973
Claims priority, application Great Britain, May 22, 1969, 26,061/69
Int. Cl. B60g *19/02*
U.S. Cl. 280—104.5 **5 Claims**



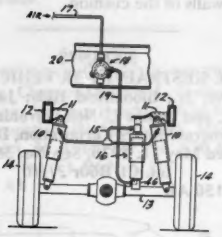
A road vehicle suspension system has a beam pivotally connected with an axle at each end and one or more rubber springs secured to a triangularly shaped block pivotally mounted on the beam, the rubber springs at their other ends being nonpivotally mounted on the frame of the vehicle, the pivot point between the rubber springs and the beam lying on or about the horizontal center plane through the metal plate secured to the pivotally secured block.

3,618,972

VALVE FOR A PNEUMATIC LEVELING SYSTEM

Walter T. Buhl, Ann Arbor, Mich., assignor to Ainsworth Industries Corporation, Toledo, Ohio and Frank M. Cobourn, executor of Harold F. Hadley, deceased, part interest to each

Filed Mar. 5, 1970, Ser. No. 16,765
Int. Cl. B60g 9/00
U.S. Cl. 280—124 5 Claims



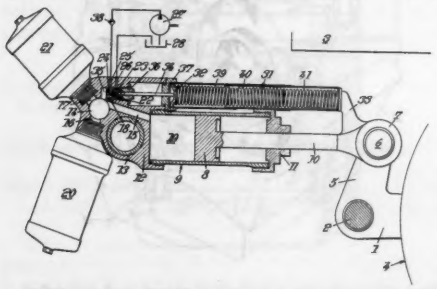
A semiautomatic activating valve for a level control for a suspension system having pneumatic support means, such as shock absorbers or air bags. The suspension system has a feeler consisting of two relatively movable parts, one being fixed to either the sprung or the unsprung structure of the vehicle and the other being movable toward the other structure by air from a source under pressure, such as a tank or a compressor, that is fed to the feeler by manual actuation of the valve from closed to open position. The valve has retaining means which hold it in open position to supply air to the feeler which extends its movable part to sense the distance separating the sprung and unsprung structures. The feeler has two alternatively openable ports between the support means and (1) atmosphere or (2) the air supply line from the valve. When the sprung structure is too low, the feeler feeds air to the support means until the sprung structure moves up to predetermined "level" spacing and the feeler moves up therewith to its "level"position. When the sprung structure is too high, the feeler extends and opens the line from the support means to atmosphere to lower the sprung structure to "level" spacing which moves the feeler down, to close the vent line. The valve also comprises a piston which is responsive to a predetermined pressure in the air line from the valve to the feeler for restoring the valve to its closed position. This results when the feeler extends to or beyond its "level" position or if the sprung structure is low but the source air is unable to raise it at least to "level" position so the feeler cannot extend and the pressure in the feeler builds up.

3,618,973

HYDROPNEUMATIC VEHICLE-WHEEL SUSPENSION SYSTEM

Jean Panhard, Paris, France, assignor to Societe De Constructions Mechaniques Panhard & Levassor, Paris, France

Filed Nov. 12, 1969, Ser. No. 875,713
Claims priority, application France, Nov. 13, 1968, 173596, Sept. 17, 1969, 6,931,666
Int. Cl. B60g 17/04
U.S. Cl. 280—124 F 16 Claims



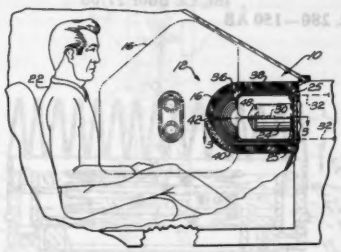
A hydropneumatic suspension comprises a suspension arm which bears the wheel and which is hinged on an axle fixed on the chassis of the vehicle. The piston which slides in the cylinder and which is adapted to displace liquid contained in a chamber connected to two oleopneumatic accumulators is pivoted on the arm. A device for replenishing liquid to the chamber is arranged so that for a given load on the wheel a certain position of the wheel with respect to the chassis is maintained despite possible leakages.

3,618,974

VEHICLE SAFETY APPARATUS

Richard Chute, Huntington Woods, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Apr. 7, 1969, Ser. No. 814,031
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 6 Claims



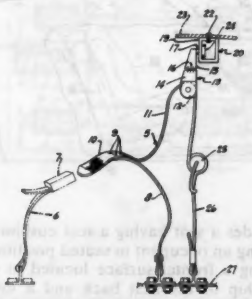
A safety apparatus for protecting an occupant of a vehicle during an accident includes a confinement having a collapsed condition and an expanded condition. Located within the confinement is a liquid reservoir having a gas-producing liquid stored under low pressure therein. An explosive charge is situated within the liquid reservoir and is ignited or detonated upon the occurrence of an accident to burst the reservoir and disperse or impel the gas-producing liquid in a particalized form into the confinement. The particalized liquid quickly vaporizes nd effects expansion of the confinement so as to protect the occupant of the vehicle from injury during the accident.

3,618,975

COMBINATION SEAT BELT AND SHOULDER HARNESS FOR AUTOMOTIVE VEHICLES AND THE LIKE

Fred B. Bombach, 1821 Litchfield Ave., Dayton, Ohio

Filed Oct. 21, 1969, Ser. No. 868,166
Int. Cl. B60r 21/00
U.S. Cl. 280—150 SB 3 Claims



This invention consists of an ordinary seat belt embodying two straps that are buckled together over the lap of a person sitting in the seat of an automotive vehicle or the like; and a shoulder harness having one end riveted or otherwise secured to one of the aforesaid straps of the seat belt. The shoulder harness passes upward, around and down over a rotatably mounted pulley that is in the lower end of a pulley support.

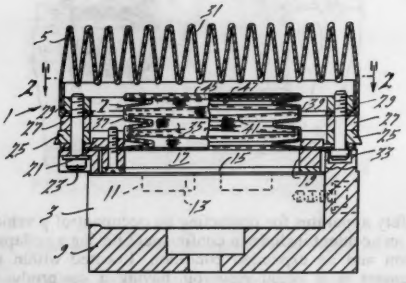
The aforesaid pulley support is swingably secured to a toggle bracket which is riveted or otherwise fastened to the underside of the roof of an automotive vehicle or the like. The rear and lower end of the aforesaid shoulder harness is now secured to a retrieving and storing pulley, after passing over the aforesaid pulley as previously stated, the retrieving and storing pulley being secured to the upper end of a vertically disposed strap that has its lower end firmly secured to the body of the aforesaid automotive vehicle or the like.

3,618,976

INFLATABLE BAG AND GAS DIFFUSING DEVICE

Maurice B. Leising, Clawson; Douglas A. Larson, Sterling Heights, and John M. Stilson, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1969, Ser. No. 870,343
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 10 Claims



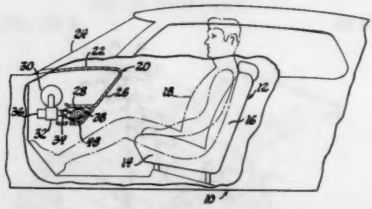
Inflatable bag device including a gas generator containing ignitable propellant, a bag adapted to be inflated by the gas released from the propellant, and an expansible chamber which filters and diffuses the gas and propellant particles discharged from the gas generator.

3,618,977

INFLATABLE OCCUPANT RESTRAINT

Edwin H. Klove, Jr., Bloomfield Hills, and James L. Noll, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 11, 1970, Ser. No. 35,954
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 1 Claim



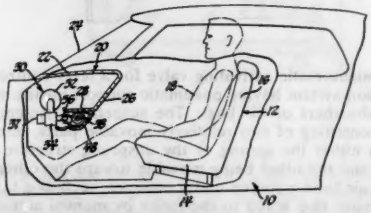
A vehicle includes a seat having a seat cushion and a seat back for supporting an occupant in seated position, an instrument panel having a frontal surface located in spaced juxtaposed relationship to the seat back and a lower surface located above the level of the seat cushion and forwardly of the occupant's knees. A source of pressure fluid on the vehicle communicates with a diffuser tube located adjacent the lower surface of the instrument panel. The pressure fluid is releasable in response to the vehicle receiving an acceleration pulse of predetermined amplitude and time. An inflatable cushion of generally tear drop shape longitudinally of the vehicle has its apical end mounted on the vehicle and communicating with the diffuser tube. When inflated by the pressure fluid, the cushion deploys rearwardly and upwardly. The upper and lower walls of the cushion flare outwardly with respect to each other from the apical end of the cushion, with the upper wall engaging the frontal surface of the instrument panel and the lower wall engaging the knees and upper leg portions of the seated occupant. These walls are interconnected by an end wall of arcuate cross section which tangentially engages the torso of the seated occupant and extends arcuately away from the torso in spaced relationship to the head of the occupant. Sidewalls interconnect the upper, lower and end walls of the cushion.

3,618,978

INFLATABLE RESTRAINT FOR VEHICLE OCCUPANT

Edwin H. Klove, Jr., Bloomfield Hills; James S. McDaniel, Birmingham, and James L. Noll, Livonia, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 11, 1970, Ser. No. 36,080
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 1 Claim



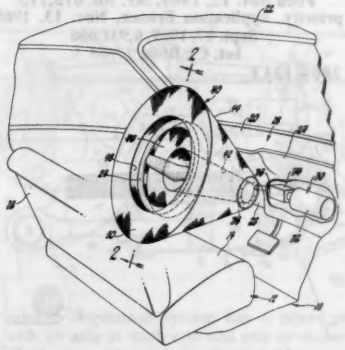
A vehicle includes a seat and a seat cushion and a seat back for supporting an occupant in seated position, an instrument panel having a frontal surface spaced from and juxtaposed to the seat back, and a source of pressure fluid releasable in response to the vehicle receiving an acceleration pulse of predetermined amplitude and time. The occupant restraint includes an inflatable cushion which is normally rolled upon itself and located below the frontal surface of the instrument panel in communication with the source of pressure fluid. When the pressure fluid is released, the cushion unrolls along the knees and upper leg portions of the seated occupant and along the frontal surface of the instrument panel and into engagement with the torso of the occupant to thereby apply a downward and rearward force on the seated occupant and fill the space between the frontal surface of the instrument panel and the upper leg portions and torso of the occupant.

3,618,979

VEHICLE OCCUPANT RESTRAINT

Ronald S. Gulette, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1970, Ser. No. 36,260
Int. Cl. B60m 21/02
U.S. Cl. 280—150 AB 1 Claim



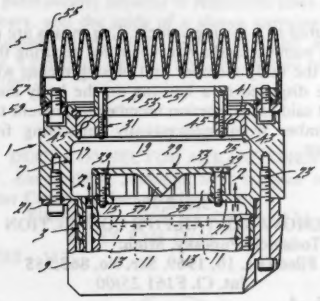
A vehicle includes a seat for supporting an operator in seated position, a steering column supporting a steering

wheel for steering the vehicle, and a source of pressure fluid releasable in response to the vehicle receiving an acceleration pulse of predetermined amplitude and time. An occupant restraint for the operator includes an inflatable cushion of generally frustoconical shape surrounding the column and wheel and having its apical end mounted on the column adjacent the instrument panel of the vehicle. When the cushion is inflated, the basal end thereof is located in a position for impact by the operator.

3,618,980
TRAP FOR NONGASEOUS MATTER

Maurice B. Leising, Clawson; Gerald L. Holbrook, Troy, and Douglas A. Larson, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1969, Ser. No. 870,470
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **8 Claims**

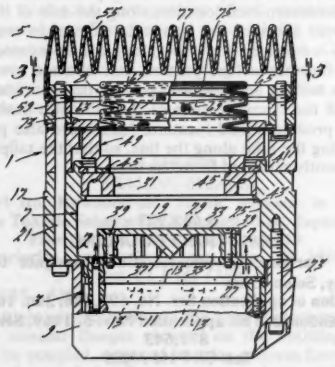


Inflatable bag device including a gas generator containing an ignitable propellant, a bag adapted to be inflated by gas released from the propellant, and a trapping device for inhibiting movement of solid or molten material from the gas generator to the interior of the bag.

3,618,981
INFLATABLE DEVICE

Maurice B. Leising, Clawson; Gerald L. Holbrook, Troy; Douglas A. Larson, Sterling Heights, and John M. Stilson, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1969, Ser. No. 873,769
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **8 Claims**

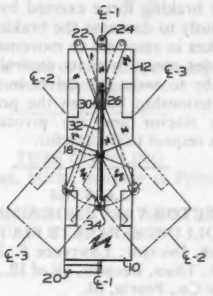


Inflatable bag device including a gas generator containing an ignitable propellant, a bag adapted to be inflated by gas released from the propellant, a trapping device for inhibiting movement of solid or molten material from the gas generator to the interior of the bag, and an expansible chamber for filtering and diffusing nongaseous matter which passes through said trapping device.

3,618,982
DRAWBAR FOR ARTICULATED VEHICLE

John A. Moore, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 18, 1969, Ser. No. 843,099
Int. Cl. B60d *7/00*
U.S. Cl. 280—408 **3 Claims**

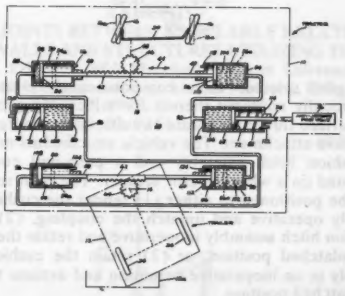


A drawbar mechanism for a vehicle made of two sections articulately connected as by a vertical pivot pin and which vehicle is steered by angling the two sections with relation to each other about the pin. The drawbar is pivoted for swinging movement behind the rear of the rearmost section and there is a connection between the forward section and the drawbar to cause the drawbar to swing in a direction opposite to that in which the vehicle is steered, thus reducing the magnitude of movement of the drawbar away from the direction of travel of the vehicle.

3,618,983
ANTIJACKKNIFING SYSTEM

Harry D. Forse, 220 Woods Road, Edgewood Addition, Anderson, Ind.

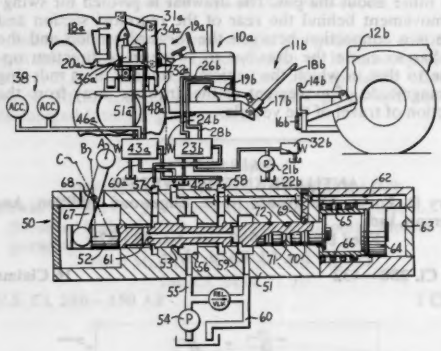
Filed Dec. 10, 1969, Ser. No. 883,826
Int. Cl. B62d *53/06*
U.S. Cl. 280—432 **16 Claims**



An antijackknifing system for a tractor-semitrailer combination. In one embodiment, a first fluid cylinder is provided having a piston with fluid on opposite sides thereof, the piston being linearly actuated in opposite directions, respectively, by turning movement of the steerable front wheels of the tractor in opposite directions from the center position. A second fluid cylinder is provided having a piston therein with fluid on opposite sides thereof, the piston being linearly actuated in opposite directions from a neutral position, respectively, by pivotal turning movement of the semitrailer with respect to the tractor in opposite directions from its centered

position. A third fluid cylinder is provided having a piston with fluid on opposite sides thereof. A first conduit connects the three cylinders on one side of the respective pistons thereby providing a first closed fluid system, and a second conduit connects the three cylinders on the opposite sides of the respective pistons thereby providing a second closed fluid system so that movement of the piston of one of the first and second cylinders away from its neutral position without corresponding coordinated movement of the piston of the other of the first and second cylinders causes movement of the piston of the third cylinder away from its neutral position to accommodate fluid displaced by movement of the piston of the one cylinder. The piston of the third cylinder is coupled to increase the braking force exerted by the trailer brakes and simultaneously to decrease the braking force exerted by the tractor brakes in response to movement of the piston of the third cylinder away from its neutral position in either direction thereby to assist the driver in restoring a normal coordinated relationship between the position of the front wheels of the tractor and the pivotal position of the semitrailer with respect to the tractor.

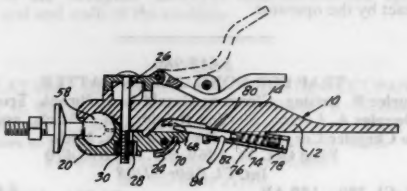
3,618,984
PILOT SELECTOR VALVE FOR SIMULTANEOUSLY CONTROLLING SEPARATE FLUID CIRCUITS
Charles F. Cook, Decatur; Lawrence F. Schexnayder, Joliet, and James W. Thais, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 28, 1969, Ser. No. 845,322
Int. Cl. B60d *1/00*
U.S. Cl. 280—481 **2 Claims**



A pilot selector valve comprises a three-position spool reciprocally mounted therein for selectively communicating pressurized fluid to separate circuits, each adapted to actuate a vehicle attachment. The vehicle attachments may comprise a cushion hitch assembly and a push-pull coupling each mounted on a wheel tractor scraper. The pilot selector valve may be positioned to either (1) render the cushion hitch assembly operative and unlatch the coupling, (2) render the cushion hitch assembly inoperative and retain the coupling in an unlatched position, or (3) retain the cushion hitch assembly in an inoperative condition and actuate the coupling to a latched position.

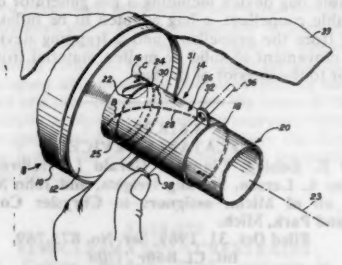
3,618,985
TRAILER HITCH
Elmer M. Farr, P.O. Box 265, Saratoga, Tex.
Filed July 25, 1969, Ser. No. 844,824
Int. Cl. B60d *1/06*
U.S. Cl. 280—512 **8 Claims**

A trailer hitch comprising a body member of elongated configuration having a socket formed in the front end thereof for receiving a ball therein, said socket formed by a semispherical recess in the upper portion of the body member and a complementary semispherical recess disposed in a lower portion hingedly connected to the body member. Said lower hinged portion is provided with a bolt member that extends therethrough and through the body member with a swivel member mounted on said bolt member and having a disc member adapted to slide along an inclined plane disposed on said body member so said semispherical recesses form a spherical socket for a socket member when the trailer



hitch is secured to a towing vehicle. Lug means are provided on the body member and a bar means for securing the swivel member to the body member and biasing means with a pin member are disposed in a housing on the body member to bear against said lower portion member to prevent the lower portion member from inadvertently separating from said body member.

3,618,986
REMOVABLE TAILPIPE CONNECTION
Anthony J. Todavich, Puposky, Minn.
Filed Oct. 10, 1969, Ser. No. 865,255
Int. Cl. F16l *25/00*
U.S. Cl. 285—4 **4 Claims**

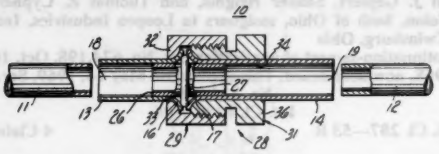


Apparatus for freeing the tube of a muffler body from a tailpipe that has an end point normally positioned inside the tube at a predetermined location along the axis of the tube. The preferred form of the apparatus comprises means for structurally weakening the tube along a line located in the tube. The line has a first portion that extends toward the body of the muffler and a second portion that extends around at least half the circumference of the tube at a position adjacent the predetermined location. Means are also provided for separating the tube along the line, so that the tailpipe may be conveniently removed from the tube.

3,618,987
LEAK-TIGHT COUPLING
Martin R. Carbone, Carpinteria, Calif., assignor to Cajon Company, Solon, Ohio
Continuation of application Ser. No. 698,346, Jan. 16, 1968, now abandoned. This application Nov. 5, 1969, Ser. No. 871,643
Int. Cl. F16l *25/00*
U.S. Cl. 285—12 **6 Claims**

Relates to a leaktight coupling having a dual capability of joining two lines together in either an easily demountable relationship or a relatively permanent relationship. Includes flanged tubular members, axially aligned with their flanges

adjacent, and a sealing member disposed between said flanges. To connect two lines in a demountable relationship, one line is permanently secured to one tubular member, the other line being passed through the other tubular member, through the sealing member, and partially into the first tubular member, the sealing member holding the second line in



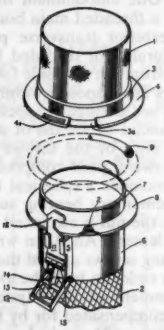
place. To connect two lines in a permanent relationship, the lines are permanently secured to respective ones of the tubular members, and the ends of a sleeve carrying the sealing member extend respectively into the tubular members. In either use, a clamping device draws the flanged tubular members together.

3,618,988

DUCT CONNECTOR ARRANGEMENT

Robert C. Zurmuehlen, Jennings, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Oct. 6, 1969, Ser. No. 864,131
Int. Cl. F16l *37/10, 37/20*
U.S. Cl. 285—312 **3 Claims**



A duct connector arrangement which includes first ring means carried by a first duct and a second ring means carried by a second duct and freely rotatable thereon. Cooperative lock means are attached to one ring to be received by slot means in the other ring means to coupled the fist and second duct means together.

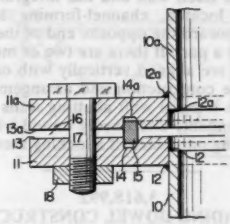
3,618,989

SEALING MEANS

Yoshinori Ito, Kawasaki-shi, Japan, assignor to Kabushiki Kaisha Tokuda Seisakusho, Kanagawa-ken, Japan

Filed Jan. 27, 1970, Ser. No. 6,249
Claims priority, application Japan, Jan. 28, 1969, 44/6855
Int. Cl. F16l *17/00*
U.S. Cl. 285—336 **2 Claims**

A fluidtight pipe coupling of the type comprising a pair of opposed annular flanges secured on the abutting ends of pipes to be coupled, opposed annular grooves formed in the opposing faces of the flanges, an annular metallic gasket disposed in the annular grooves. Each of the grooves has an outer cylindrical sidewall and an inner conical sidewall having diameters decreasing toward the mating groove. The gasket is of rectangular cross section and the inner corner or edges thereof are in tight engagement with the conical walls,



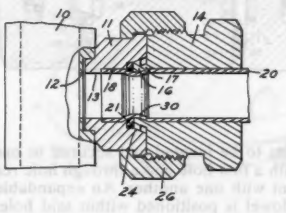
the outer cylindrical wall of the gasket being slightly spaced apart from the outer walls of the grooves.

3,618,990

TUBE COUPLING

Jay F. Falke, Adrian, Mich., assignor to Primore Sales, Inc., Adrian, Mich.

Filed July 14, 1969, Ser. No. 841,627
Int. Cl. F16l *19/00*
U.S. Cl. 285—343 **11 Claims**



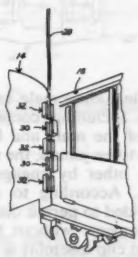
A refrigeration tubing coupling for connecting deformable tubing to a refrigeration unit or to another length of refrigeration tubing. The coupling comprises two bodies having openings therein, one of the bodies has an annular projection which engages a surface on the second body and is deformed radially inwardly upon axial movement of the bodies toward one another to clamp the tubing and form the seal.

3,618,991

CORNER JOINTS BETWEEN ANGULARLY RELATED, MOLDED WALLS AND STRUCTURES UTILIZING THEM

Clarence K. Edwards, 865 Morrison St., and Lawrence D. Edwards, 2816 Rosemont Ave., both of Medford, Oreg.

Filed Apr. 9, 1970, Ser. No. 26,910
Int. Cl. F16b *5/07*
U.S. Cl. 287—20.92 D **6 Claims**



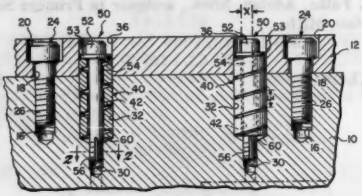
A novel joint structure is provided for molded wall members which may be designed, for example, to be combined into sides and ends of model railway cars, model buildings suitable for use as wayside scenery in model railway setups,

or in any box, box tray, fence or other enclosure. At the corner of structure, angularly related walls are brought into abutting relation. Each wall end has integral with it one or more interiorly located, channel-forming brackets whose open sides face toward the opposite end of the wall from that of which it forms a part. If there are two or more brackets on a wall end, they are aligned vertically with one another and spaced apart, the construction and arrangement being such that the brackets integral with abutting walls can be aligned and can be dependably and fixedly united with one another by the mere sliding into place of a locking member.

3,618,992
EXPANDING DOWEL CONSTRUCTION

Lawrence V. Whistler, Sr., 259 Doncaster Road, and Lawrence V. Whistler, Jr., 251 Doncaster Road, both of Kenmore, N.Y.

Continuation-in-part of application Ser. No. 755,151, Aug. 26, 1968, now abandoned. This application May 9, 1969, Ser. No. 840,078
Int. Cl. E04c *3/00*
U.S. Cl. 287—20.92 E **20 Claims**

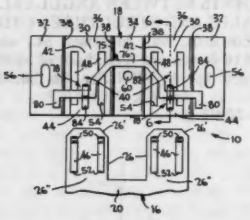


A pair of parts to be located and secured to one another are provided with a first hole and a through hole respectively and in alignment with one another. An expandable resilient helical spring dowel is positioned within said holes, and an expanding means cooperates with the dowel to expand it into engagement with the holes to properly align the parts.

3,618,993
CLIP ASSEMBLY

Eugene L. Platte, 305 South Harvard, Robinson, Ill.

Continuation-in-part of application Ser. No. 3800, Jan. 19, 1970. This application June 8, 1970, Ser. No. 44,258
Int. Cl. F16b *5/06*
U.S. Cl. 287—20.924 **25 Claims**

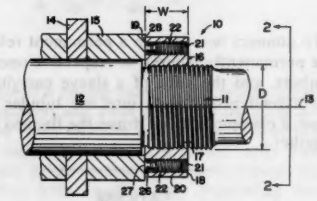


A clip assembly including male and female clip elements having clip means including cooperating locking means. After securement of the male and female clip elements to structural members to be joined, the structural members may be locked to each other by engagement of the male and female clip means. According to one embodiment, yoke means may be provided to permit disengagement of the male and female clip elements without the need for additional tools. A small round clip assembly is also disclosed for use in close areas. Teeth may be used to preclude rotation of the clip elements if a single-securing means is used to attach a clip element to a supporting member. A further feature includes a plurality of spaced locking means to permit locking of the clip elements even if they are not fully engaged. A further feature provides a clip element used for attaching structural members in an angular relationship which is collapsible for compactness in shipping of the clip element prior to use.

3,618,994
ARBOR NUT

Paul J. Gepfert, Shaker Heights, and Thomas E. Cyphert, Solon, both of Ohio, assignors to Loopco Industries, Inc., Twinsburg, Ohio

Continuation-in-part of application Ser. No. 674,198, Oct. 10, 1968, now abandoned. This application May 14, 1969, Ser. No. 824,648
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 R **4 Claims**



Disclosed are several embodiments of an invention relating to an arbor nut for detachably interconnecting and tightening machine elements. One embodiment of the nut includes a body provided with a threaded main bore, a first and second side face and an exterior transverse peripheral face lying therebetween. A plurality of threaded bores are defined in the body extending from the first side face to the second side face. Jacking screws are disposed within each of said bores. The jacking screws are defined by socket heads adapted to be turned and advanced by means of an Allen wrench and swivel pads at the ends of the screws opposite the socket heads. Each of the swivel pads comprises a bearing element having a face and includes a spherical bearing seat adapted to engage a complementary bearing surface of the jacking screw. In operation, the nut is advanced hand tight against an adjacent machine element. An Allen wrench is then utilized to advance the jacking screws against the face of the adjacent machine element in order to lock the elements firmly on the arbor. Any misalignment of the adjacent element and the body of the nut is compensated for by the swivel pad at the end of the jacking screw. The swivel pad also isolates the rotary movement of the jacking screw from the adjacent machine element.

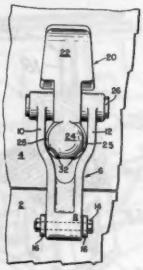
A second embodiment of the invention includes the nut as heretofore described which further includes an additional bore in the body of the nut extending from its first side face to its second side face. A locking member, disposed in the additional bore has a threaded portion engaged with the threaded portion of the additional bore and includes an end portion which is capable of extending beyond the first side face of the nut to engage a recess in the machine element adjacent to the nut. A pilot hole may also be provided in the nut for locating one or more recesses in the adjacent machine element. If desired, the recesses in the adjacent machine element may take the form of a cylindrical bore complementary in shape to the locking member.

A third embodiment of the nut according to the invention includes a pair of opposed faces forming a gap in the body of the nut, each opposed face being defined by a surface having the perimeter comprising the threaded main bore of the nut, its first and second side faces, and its exterior peripheral surface. In a preferred embodiment, an adjustment means includes a threaded bore and counterbore extending from the exterior surface of the body of the nut beyond the pair of opposed faces in a direction generally transverse to the faces. A securing member is located in said threaded bore in such a manner that the rotation of the securing member causes a change in the length of the gap.

3,618,995
OVER CENTER RUBBER HOOD HOOK

Allan D. McLean, Seattle, Wash., assignor to Pacific Car and Foundry Company, Bellevue, Wash.

Filed June 10, 1970, Ser. No. 45,184
Int. Cl. E05c *5/00, 19/14*
U.S. Cl. 292—66 9 Claims

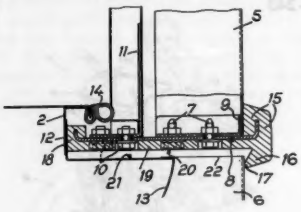


A latching means for use upon the hood of a vehicle. The latch has a ball and socket interlock with definitive camming surfaces and the elements are so interrelated that the latching action includes an over center movement. The over center movement of the latch allows for greater latch security with far less operator effort. In most installations, the operating force required to operate this latch is horizontal, away from the body, as opposed to a vertical force at arms length that is required on latches without this over center feature.

3,618,996
BUMPERS FOR MOTOR VEHICLES

Jean G. Cadiou, Saint-Cloud, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Nov. 12, 1969, Ser. No. 875,935
Claims priority, application France, Nov. 14, 1968, 173 702
Int. Cl. B60r *19/08*; B62d *25/12*
U.S. Cl. 293—63 6 Claims



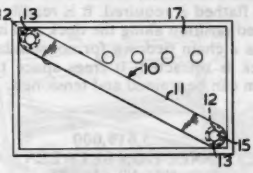
This invention relates to a bumper constituted at least by one central element and two stops, each comprising a reinforcement rigidly fixed to the central element, wherein the reinforcement of each stop is rigidly fixed to a movable panel articulated to a rigid frame, while the reinforcement is in abutment on the frame when the panel is in closed position with respect to said frame.

3,618,997
BATTERY STRAP HOLDER

Hugh M. Cochrane, 23 Taber Road, Toronto, Ontario, Canada

Filed Sept. 22, 1969, Ser. No. 859,874
Int. Cl. B25b *9/00*
U.S. Cl. 294—63 B 5 Claims

A lifting device for electric storage batteries which comprises a flexible nonmetallic lifting handle and a gripping member recessed in each end of said handle, said handle and said gripping members having concomitant circular openings

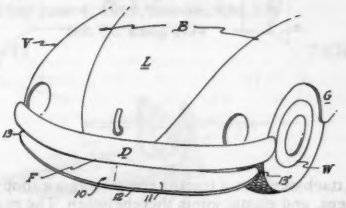


of a size and shape capable of receiving and gripping the terminal posts of a storage battery.

3,618,998
WINDLOAD APPLICATOR AND STABILIZER FOR STEERABLE FRONT WHEELS OF REAR-ENGINED VEHICLES

Donald A. Swauger, 20616 Blackhawk St., Chatsworth, Calif.

Filed Apr. 15, 1970, Ser. No. 28,654
Int. Cl. B62d *37/00*
U.S. Cl. 296—1 S 8 Claims

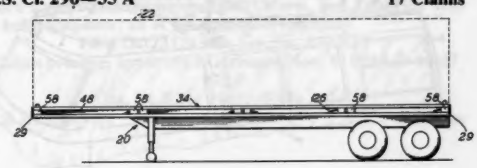


In an airfoil windload applicator for automatically increasing traction between the tires of the steerable front wheels of a rear-engined vehicle and the pavement in increments dependent upon acceleration of speed of such vehicle relative thereto an airfoil member pivotally mounted adjacent and relative to a flat pan bottom and spring loaded means for supporting the airfoil member at a normally raised position, but yieldable for increased inclination and greater downward pressure of such tires upon the pavement.

3,618,999
CONVERTIBLE SECUREMENT APPARATUS FOR SECURING STANDARD CONTAINERS AND NONSTANDARD CARGO ON VEHICLES

Emil J. Hlinsky, Oakbrook, and Allen D. Siblik, Mundelein, both of Ill., assignors to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed May 18, 1970, Ser. No. 38,292
Int. Cl. B60p *7/08*
U.S. Cl. 296—35 A 17 Claims



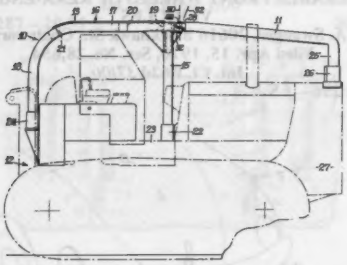
Securement apparatus having a movable pedestal alternately usable either as a retractable twist lock or a chain tiedown winch. It is adapted to be used, for example, along the sides of vehicles such as flatbed trucks or railway flatcars, for releasably locking a standard container, or a nonstandard load such as a carton, a pallet or a machine packed for shipment. The device is movable along the side of the vehicle for use on a wide variety and combination of loads. The twist

lock is elevatable above the level of the vehicle deck to secure standard containers, and is retractable below the deck level when a flatbed is required. It is readily movable for use at any selected position along the deck and is easily convertible for use as a chain tiedown for nonstandard cargo. When the twist lock is retracted, it frees space through which a tiedown chain can be trained and tensioned.

3,619,000
ELASTIC CONNECTION BETWEEN CANOPY AND FRONT SWEEP

William P. Macarus, Palos Park, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 3,625
Int. Cl. B62d *25/06*
U.S. Cl. 296—102 **5 Claims**

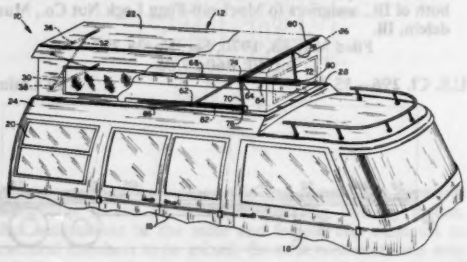


Attachment for a tractor comprising a canopy frame, front sweeps, and elastic joints therebetween. The rear ends of two front sweeps are connected to projecting front end portions on a sweep frame adjacent its middle legs in elastic joints each of which comprises a bolt loosely extending through openings in the end portions on the canopy frame and the rear ends of the front sweep, rubber bushings around the bolt and within the openings, and rubber washers on the bolt between the bolt head, canopy frame, front sweep, and nut on the bolt.

3,619,001
VEHICLE WITH RETRACTABLE AND EXTENSIBLE ROOF ASSEMBLY

Charles L. Borskey, P.O. Box 26, Andrews, Ind.

Filed Mar. 18, 1970, Ser. No. 20,545
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 B **4 Claims**

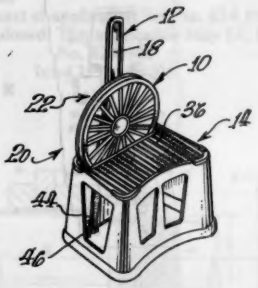


A vehicle with a retractable and extensible roof assembly comprising a ceiling for the vehicle having an opening formed at one end thereof, a vertically movable roof portion over the ceiling, movable between a fully extended portion and a retractable portion having flexible sidewalls between the movable roof portion in the ceiling, and spring biased means for aiding in the elevation of the roof to the fully extended position thereof.

3,619,002
COMBINATION TOY AND CHAIR

Jay McKinney, P.O. Box 95, Dewey, Ariz., and John M. Adams, Golden, Colo., assignors to said Adams, to said McKinney, Dewey, Ariz.

Filed May 1, 1970, Ser. No. 033,693
Int. Cl. A47c *13/00*
U.S. Cl. 297—118 **3 Claims**

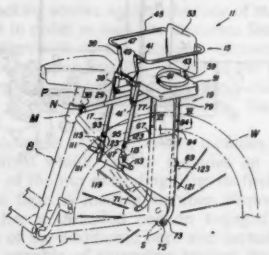


A stool having in its top at the rear thereof a transverse wheel recess for receiving therein a lower portion of a wheel in an upright position with the major portion of the wheel projecting above the top of the stool to provide a backrest. The stool also has in the top thereof rearwardly of the wheel recess a paddle recess for receiving a paddle therein in an upright position and with a handle portion of the paddle projecting above the top of the stool behind the wheel, the paddle being locked in its recess against withdrawal when the wheel is in its recess. Upon removal of the wheel and then the paddle from their respective recesses, the wheel and paddle may be used as a toy by employing the paddle to roll the wheel over any suitable surface.

3,619,003
REAR-MOUNTED BABY SEAT FOR A BICYCLE

Maurice E. Rich, Jr., Memphis, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.

Filed Jan. 27, 1970, Ser. No. 6,248
Int. Cl. A47c *15/00*
U.S. Cl. 297—243 **6 Claims**



A baby seat for mounting on the rear of a bicycle. The baby seat includes a horizontally extending lower frame assembly, an upper frame assembly attached to the lower frame assembly and defining an upwardly oriented interior adapted to receive the baby, and support braces for supporting the baby seat from the bicycle.

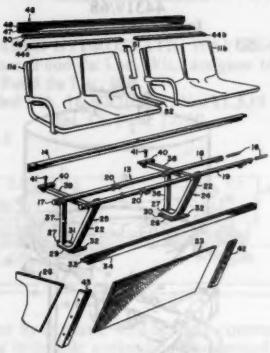
3,619,004
CANTILEVER SEAT STRUCTURE

Thomas J. McKernan, and Douglas J. Arendsen, both of Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Dec. 23, 1969, Ser. No. 887,717
Int. Cl. A47c *1/12*
U.S. Cl. 297—248 **8 Claims**

A chair structure is supported upon a plurality of spaced support frames, each having a rear vertical leg, and a front

leg extending from said rear leg forwardly and then upwardly and forwardly to a spaced distance from the top of the rear leg, the frame having horizontal rails connecting the front and rear legs and extending rearwardly therefrom, attachment means being provided for securing the rearwardly extending rails to a wall or other support. Longitudinal rails



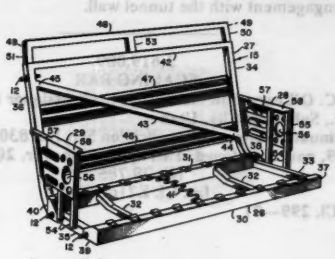
connect the spaced support frames, and chairs are mounted upon the support frame structure. Closure panels extend at an inclination from the bottom of the rear leg upwardly to enclose the front of the seat structure, while side panels close the ends of the seat structure. At the top of the seat structure, a plastic closure is provided for adjustably closing the space between the top of the seat structure and the wall.

3,619,005
RESTRAINING DEVICE FOR WHEELCHAIRS AND THE LIKE
Garnet Hardy, 1227 North Main St., Marion, Ohio
Filed Apr. 16, 1969, Ser. No. 816,593
Int. Cl. A47c *31/00*
U.S. Cl. 297—390 **1 Claim**

A restraining device for use with wheelchairs and the like, for preventing patients from falling out and hurting themselves. The device includes a padded bar which extends above and across the seat portion of the chair, and is supported by a pair of brackets oppositely arranged on the side arms of the chair.

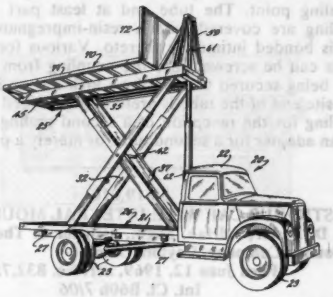
3,619,006
VEHICLE CANTILEVER SEAT
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Apr. 22, 1970, Ser. No. 30,635
Int. Cl. A47c *7/00, 7/20;* **B60n** *1/00*
U.S. Cl. 297—450 **12 Claims**

A cantilever seat or chair frame is adjustably suspended from a vehicle sidewall from a plate in the sidewall at the upper inner end of the chair back adjacent the wall and with a cushion-concealed diagonal strut extending through a side rail of the back downwardly to the outer lower end of the frame adjacent the junction of the back and chair seat. Safety



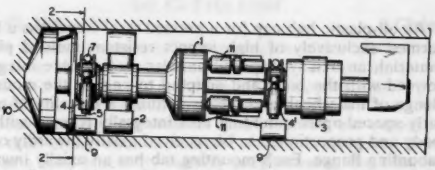
energy-absorbing panels are provided by the seat and arm rests together with cross braces to provide torque resistance.

3,619,007
STATIONARY OR MOBILE, RELATIVELY MOVABLE, LOAD-CARRYING, POWERED MEMBERS
William N. Phillips, Auburndale, Fla., assignor to Leco, Inc., Lakeland, Fla.
Filed June 4, 1969, Ser. No. 830,376
Int. Cl. B60p *1/34*
U.S. Cl. 298—11 **7 Claims**



Relatively movable load-carrying members connected to be maintained in predetermined relation with hydraulic means for producing relative movement, to serve for example as a hi-lift, the device being of a character to be mounted on a fixed or other base such as a vehicle, and also designed to be tilted to dump a load carried thereby.

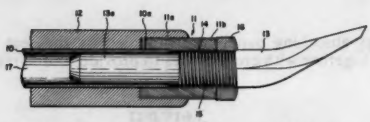
3,619,008
SUPPORTING AND ROTATIONAL RESETTING DEVICE ON A TUNNEL-DRIVING MACHINE
Gerd Kampf-Emden; Heinz Robert Horst, and Friedrich Wilhelm Klapdohr, all of Rheinhausen, Germany
Filed Oct. 31, 1969, Ser. No. 872,827
Claims priority, application Germany, Nov. 9, 1968, P 18 07 973.7
Int. Cl. E21c *29/02;* **E01g** *3/04*
U.S. Cl. 299—31 **5 Claims**



A tunnel-driving device comprising a machine frame for a driving machine which rotatably drives a tunnel-extracting

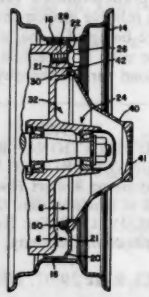
tool. The machine frame is centrally positioned in respect to the tunnel by a forward bracing assembly and a rear bracing assembly having elements which may be moved outwardly into engagement with the tunnel wall.

3,619,009
SCALING BAR
Paul C. O'Leary, Salt Lake City, Utah, assignor to Rock Tools Inc., Salt Lake City, Utah
Continuation-in-part of application Ser. No. 830,183, May 7, 1969, now abandoned. This application Apr. 20, 1970, Ser. No. 29,785
Int. Cl. E21c 37/26
U.S. Cl. 299—91 14 Claims



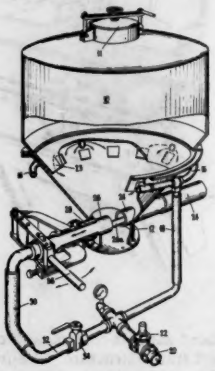
A scaling bar for prying overhanging rock from mine tunnels and the like. An elongate, relatively thin-walled tube of lightweight material, such as aluminum, has an end closely fitted into engagement with and secured to one end of a relatively thick-walled coupling that is internally threaded at its other end for the reception of the externally threaded end of a scaling point. The tube and at least part of the sleeve coupling are covered with a resin-impregnated fiber glass that is bonded intimately thereto. Various forms of scaling points can be screwed into the coupling from time to time, each being secured in place by a lock nut on its shank. The opposite end of the tube is preferably provided with a similar coupling for the reception of a second scaling point, a handle, an adapter for a second tube, or merely a plug.

3,619,010
PLASTIC HUB CAP WITH INTEGRAL MOUNTING TABS
Alan D. Foster, Adrian, Mich., assignor to The Dayton Steel Foundry Company, Dayton, Ohio
Filed June 12, 1969, Ser. No. 832,756
Int. Cl. B60b 7/06
U.S. Cl. 301—37 P 2 Claims



An all-plastic hub cap for a pressed steel wheel has a body formed exclusively of high impact resistant molded plastic material, an axially disposed annular seating face integrally formed with the body and adapted to engage the mounting flange of the wheel, and means defining a plurality of angularly spaced-apart mounting tabs integrally formed with the body and proportioned to be received axially inwardly of the mounting flange. Each mounting tab has an axially inwardly and radially outwardly extending surface which defines with the seating face an annular depression adapted to receive the mounting flange to form an interference fit therewith.

3,619,011
APPARATUS FOR DISCHARGING PARTICULATE MATERIAL FROM CONTAINERS
Allan M. Doble, Hughesdale, Victoria, Australia, assignor to Godfrey Engineering (Australia) Pty. Ltd., Victoria, Australia
Filed Sept. 30, 1969, Ser. No. 862,291
Claims priority, application Australia, Sept. 4, 1968, 44319/68
Int. Cl. B65g 53/04
U.S. Cl. 302—53 6 Claims

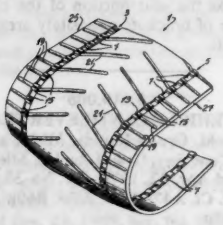


This invention relates to improved means for discharging particulate material such as flour or cement from a hopper or like container, particularly those fitted to vehicles for the transport of such material.

The hopper is of generally cylindrical construction converging to a reduced vertical cylindrical extension at the bottom forming a well from which the material is discharged.

A discharge pipe extends radially outwardly through the wall of the well and an air pipe extends radially through the wall of the well diametrically opposite the discharge pipe. The air pipe has a forward extension of reduced diameter which enters the inlet opening of the discharge pipe and the end of the air pipe around the forward extension is sealed off. The air pipe is axially slidable in a stuffing box so that in its fully extended position it abuts against the end of the discharge pipe preventing discharge of material, whilst in its fully retracted position a space is provided between the ends of both pipes permitting discharge of material which is aerated and blown through the discharge pipe by the air passing through the reduced forward extension of the air pipe.

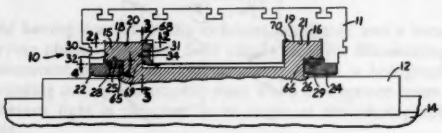
3,619,012
SNOW TRACK
Rejean Bizier, and Pierre Paul Triacca, both of 829 Woodward, Sherbrooke, Quebec, Canada
Filed Oct. 3, 1969, Ser. No. 863,592
Int. Cl. B62d 55/24
U.S. Cl. 305—38 4 Claims



The commonly known endless track for snow vehicle of the type comprising a single continuous belt of rubber

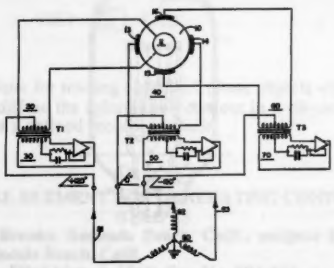
material to wind around one or a pair of spaced apart sprocket wheels when provided with the required sprocket-tooth apertures is improved by providing means to define a transverse outer convex shape in the belt, and these means are resiliently deformable to provide a substantially flat running and bearing surface for the snow vehicle when the same is loaded.

3,619,013
PRELOADED HYDROSTATIC WAY-BEARING
Gordon H. Jones, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.
Filed Feb. 16, 1970, Ser. No. 11,539
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 **6 Claims**



An improved hydrostatic way-bearing construction is disclosed utilizing hydraulic preloading of opposed way bearing surfaces between relatively slidable machine tool members. Said construction comprises preload gibs having hydrostatic bearing surfaces, preloading being accomplished by a plurality of longitudinally spaced hydraulic actuators, some recessed within the holddown cleats of the supported member and others recessed within one of the preload gibs. All of the bearing surfaces are completely enclosed by seals and exhaust oil therefrom is scavenged by means of a suction pump.

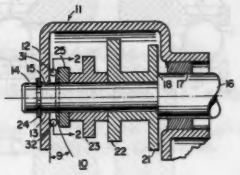
3,619,014
GYROSCOPE
William H. Quick, La Mirada, Calif., assignor to North American Rockwell Corporation
Continuation of application Ser. No. 442,135, Mar. 23, 1965. This application Apr. 2, 1970, Ser. No. 31,808
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **12 Claims**



A gyroscope including a rotor positioned between a plurality of electrodes. An electrostatic support arrangement establishes an AC potential between the rotor and the electrodes. A differential sensing arrangement for providing a position signal is secured to the electrodes. A servo arrangement, including an amplifier, is connected between the sensing arrangement and a power supply circuit for maintaining the rotor centered between the electrodes.

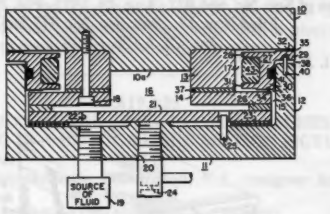
3,619,015
BEARING DEVICE HAVING END PLAY ELIMINATION MEANS
Andre Frans Goossens, Waasmunster-Sombeke, Belgium, assignor to The Singer Company, Rochester, N.Y.
Filed Jan. 6, 1970, Ser. No. 990
Int. Cl. F16c *17/04*
U.S. Cl. 308—135 **3 Claims**

Bearing device having end play elimination means is disclosed wherein axial dimensional tolerance buildup along one axis is substantially eliminated by a conical spacer coaxially disposed along said one axis and a resilient spring member



having detenting portions which coact in a wedgelike manner with the conical spacer in a plane normal to the plane of said one axis to eliminate end play along the said one axis.

3,619,016
HYDROSTATIC BEARING
Charles E. Kraus, Allendale, N.J., assignor to Excelermatic, Inc.
Continuation-in-part of application Ser. No. 707,911, Feb. 5, 1968. This application Sept. 9, 1969, Ser. No. 871,458
Int. Cl. F16c *17/04*
U.S. Cl. 308—160 **24 Claims**

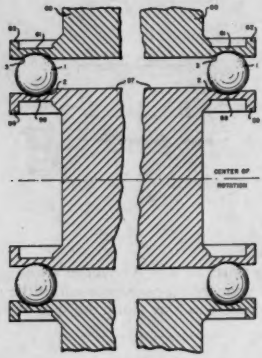


A hydrostatic bearing for supporting a load-carrying member or assembly, such as the roller in a toroidal drive, from a stationary frame or casing in which a spacer carried by the load member and the stationary member define a secondary cavity within a primary cavity and within which there is a pressure responsive element, such as a single or multiple ring, subjected to fluid under such pressure and in such directions as to interpose fluid between the stationary member and the pressure element and between the pressure element and the load-carrying member and which constitutes a balancing factor.

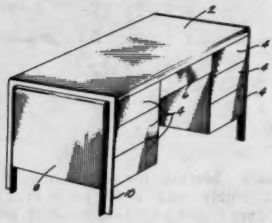
3,619,017
LOW-STRESS BALL BEARINGS
John F. Robinson, Newport Beach, and Lynn A. Shackelford, Villa Park, both of Calif., assignors to North American Rockwell Corporation
Division of Ser. No. 756,757, Sept. 3, 1968, Pat. No. 3,549,220. Filed Apr. 9, 1970, Ser. No. 27,004
Int. Cl. F16c *27/04*
U.S. Cl. 308—184 **9 Claims**

The invention relates to ball bearings in which the Hertzian stresses in the raceways are reduced by a construction in which one or both race members are so supported as to permit deflection in the manner of a beam in distinction to conventional bearings wherein the race members are supported over their entire circumferential area and compressed in effect as a solid block. By suitably proportioning the effective length and depth of the beam structure, in relation to the strength of the race material and to the applied load, a marked reduction in localized stresses and a consequent

marked increase in operating life is achieved, without attendant disadvantages such as excessive decrease in stiffness, increase in friction, etc.



3,619,018
FURNITURE CONSTRUCTION
Mark K. Wallach, New York, N.Y., assignor to Stow/Davis Furniture Company, Grand Rapids, Mich.
Division of Ser. No. 664,071, Aug. 29, 1971, Pat. No. 3,479,102.
Filed Nov. 17, 1969, Ser. No. 877,265
Int. Cl. A47b *47/00*
U.S. Cl. 312—107 **7 Claims**

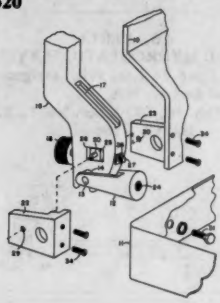


This disclosure relates to furniture construction in which a novel end structure is attached to a rigid furniture construction comprising, for example, a rigid three box construction. In one embodiment there is formed a subassembly comprising a sub-top, back, bottom, four upstanding bulkhead members positioned along and perpendicular to the sub-top and back, and a centrally located fifth bulkhead member which is parallel to the back. The back and the sub-top can be grooved to receive the four upstanding bulkheads. The subassembly has three aligned, interconnected, rigid boxes. The two end boxes have an open side.

The subassembly can be employed in the construction of desks, credenzas, and the like. A finished top and a finished back panel are attached to the subassembly. Leg units and finished side panels are then applied to substantially cover the subassembly. Drawers and shelves can be added to make a finished unit.

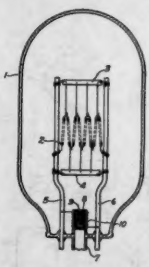
The novel end structure comprises a flat, inverted, U-shaped member which is coextensive with the furniture top and two sides thereof and has a pair of flat, longitudinal bars attached to the legs of the U-shaped members. The bars are substantially perpendicular to the plane of the U-shaped members and preferably contain a finished filler therebetween.

3,619,019
VARIABLE LENGTH COMPENSATING LEVER LATCH HANDLE MECHANSIM
Casswell C. Hepker, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed Dec. 22, 1969, Ser. No. 887,014
Int. Cl. A47b *88/00, 95/02*
U.S. Cl. 312—320 **5 Claims**



A cam-lock handle to facilitate insertion, extraction, and holddown functions between a demountable equipment or device and its container or mounting base includes an operational variable pivot point assembly for the handle by means of which the mechanical advantage of the handle may be varied to optimize handle functions and ready adjustment for variations in equipment lengths is permitted.

3,619,020
METHOD OF INTRODUCING HALOGENS INTO ELECTRIC LAMPS
Oskar Herrmann, Berlin, Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH
Filed Oct. 8, 1969, Ser. No. 864,719
Claims priority, application Germany, Nov. 21, 1968, P 18 10 149.0
Int. Cl. H01j *9/38*
U.S. Cl. 316—24 **2 Claims**

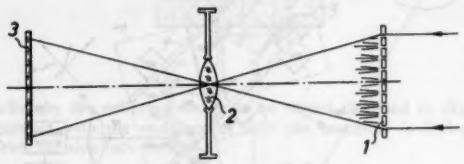


In the process of introducing a halogen into a lamp in the form of a halogenated hydrocarbon, the feed conduit or exhaust tube is extended into the interior of the lamp bulb where it contains a tungsten surface area which is locally heated to a temperature sufficiently high to decompose the hydrocarbon and precipitate the carbon thereat.

3,619,021
METHOD OF MAKING A DIFFUSING LAYER
Klaus Biedermann, Unterhaching, and Friedrich Bestenreiner, Gruenwald, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 9, 1970, Ser. No. 27,038
Claims priority, application Germany, Apr. 11, 1969, P 19 18 375.6
Int. Cl. G02b *5/02*
U.S. Cl. 350—3.5 **6 Claims**

A photosensitive layer is exposed by a first light wave field having random phase distribution with peaks and valleys

representing different amounts of exposing light, whereupon the exposed layer is developed and treated to reduce the differences between the lengths of the optical path so that they are less than half of the wavelength of light and so that a laser beam passing through the layer forms a second wave

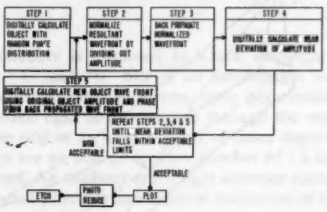


field having a substantially constant amplitude and a locally varying phase. This wave field can be used for illuminating a transparent picture so that the same forms a holographic recording on a photographic plate when a reference beam of coherent light is directed at an angle at the photographic plate.

3,619,022
METHOD OF MAKING AN OBJECT DEPENDENT DIFFUSER

Peter M. Hirsch; James A. Jordan, Jr., and Louis B. Lesem, all of Houston, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 17, 1970, Ser. No. 72,948
Int. Cl. G02b *5/02, 27/00*
U.S. Cl. 350—3.5 **8 Claims**

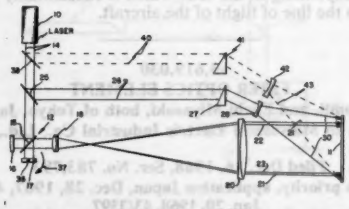


A technique for making optimized phase objects which can uniformly diffuse the information content in a physical wave front across a defined recording plane.

3,619,023
OPTICAL ELEMENT FOR GENERATING CONTOUR STRIPES

Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 4, 1969, Ser. No. 804,207
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **8 Claims**

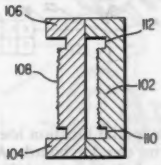


An optical element for generating in space a fringe pattern consisting of light maxima and minima. This optical element consists of a hologram on which light from two adjacent light sources generating light of substantially the same frequency has been recorded. The fringe pattern may be utilized for moire gauging or for the production of contour maps. One hologram may have a single fringe pattern or a plurality of fringe patterns recorded thereon. Also, a simplified holographic apparatus is disclosed for producing the optical element.

3,619,024
PACKING OF HOLOTAPE

Joseph Ralph Frattarola, Hightstown, N.J., assignor to RCA Corporation

Filed Sept. 29, 1969, Ser. No. 861,675
Int. Cl. G02b *5/00*; **G03c** *1/76*
U.S. Cl. 350—3.5 **1 Claim**

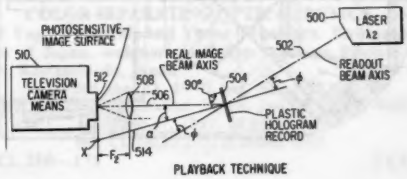


A hologram in the form of a flexible tape, either metal or plastic, has a central region of a first thickness and having a hologram relief pattern thereon and edge regions of a greater thickness so as to provide protective ridges for the relief pattern when wound upon itself. A method of making such a hologram includes, placing a hologram original on a backing material wider than the original, metallizing the exposed surfaces of the original and backing layer, separating the metallized layer from the original and backing to form a master, embossing the hologram from the master into a plastic tape having a width greater than that of the master.

3,619,025
ELIMINATION OF THE EFFECTS OF SCRATCHES AND TWISTING IN A HOLOGRAPHIC MOTION PICTURE TAPE

William James Hannan, Pennington, N.J., assignor to RCA Corporation

Filed Sept. 30, 1969, Ser. No. 862,272
Int. Cl. G03b *27/00*
U.S. Cl. 350—3.5 **11 Claims**



Longitudinal streak in playback of pressed phase hologram motion pictures on plastic tape, due to diffraction by longitudinal scratches on the plastic tape, which is normally superimposed on reconstructed image, is eliminated by recording phase hologram with object beam oblique to surface of recording medium. This displaces the streak from the area of the reconstructed image.

Angle of incidence of readout beam is optimized to produce minimum shift in the axis of the image beam in response to any twisting of flexible tape.

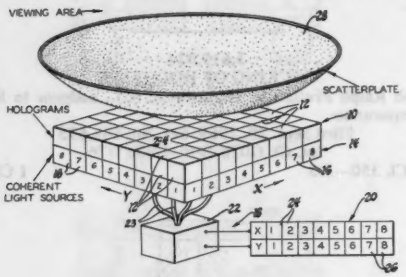
3,619,026
THREE-DIMENSIONAL HOLOGRAM DISPLAY

Ivan Cindrich, Southfield, Mich., assignor to Chain Lakes Research Corporation, Detroit, Mich.

Filed Oct. 6, 1969, Ser. No. 863,898
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **3 Claims**

A holographic image-reproduction apparatus comprising coextensive two-dimensional arrays of developed holograms

and coherent light sources operable by a keyboard and logic unit to permit selective energization of sources. Each hologram contains at least one interference pattern representing



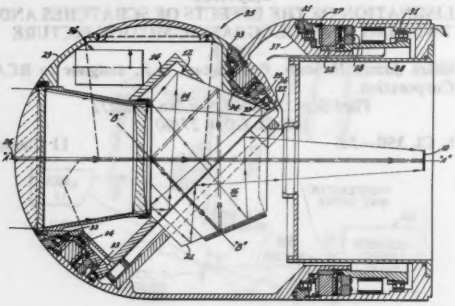
an object image at a spatial location identified by coordinate selection switches in the keyboard. A nonflat diffuser is disposed between the holograms and the viewing area to permit 360° viewing.

3,619,027

OPTICAL SIGHTING DEVICE FOR FULL HEMISPHERIC VIEWING EMPLOYING A PECHAN PRISM

William G. Baker, Rolling Hills Estates, and James H. Gisbrecht, Rolling Hills, both of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed June 9, 1970, Ser. No. 44,747
Int. Cl. G02b *17/00, 5/04, 7/18*
U.S. Cl. 350—6 **3 Claims**



Optical equipment including a Pechan prism functioning to retain the image plane (eyepiece) in a fixed relation with respect to nonmovable components of the equipment while making possible full hemispherical viewing.

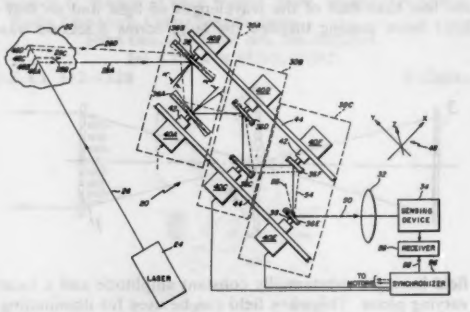
3,619,028

FOURIER OPTICAL SCANNER

Wayne H. Keene, Medfield, and Charles M. Sonnenschein, Natick, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 25, 1970, Ser. No. 49,678
Int. Cl. G02b *17/06*
U.S. Cl. 350—7 **6 Claims**

An optical-scanning system comprising a series of paired scanning mirrors. In each pair of mirrors, the two mirrors are counterrotated about parallel axes and are tilted equally with respect to the axes whereby an incident beam of light is reflected by the two mirrors and emerges with a sinusodial oscillation. The paired mirrors are positioned so that the emerging beam from one pair of mirrors is incident upon the next pair of mirrors. The angles of tilt in the various pairs of mirrors are selected in accordance with Fourier coefficients



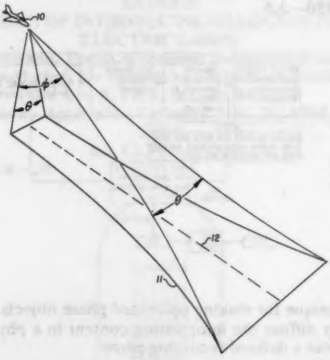
so that the final emerging beam oscillates with any desired format such as a sawtooth scan.

3,619,029

INFRARED-RECONNAISSANCE SYSTEM

James D. Crownover, Dallas, Tex., assignor to Texas Instruments Incorporated, 13500 North Central Expressway, Dallas 31, Tex.

Filed Nov. 26, 1965, Ser. No. 511,022
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **3 Claims**



An infrared-reconnaissance system is disclosed which comprises an infrared detector, optical means for both viewing the forward area defined by a predetermined elevation angle and for simultaneously scanning an area substantially perpendicular to the line of flight of the aircraft and transmitting same to the detector. Display means responsive to the video output of the detector produces a visual image of the radiation sensed along a first display dimension corresponding to the elevation angle scan and along a second display dimension corresponding to the scan which is substantially perpendicular to the line of flight of the aircraft.

3,619,030

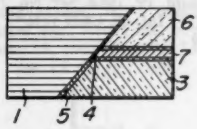
FIBER OPTICS ELEMENT

Kaoru Tomii, and Eiichi Miyazaki, both of Tokyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1968, Ser. No. 783,793
Claims priority, application Japan, Dec. 28, 1967, 43/88
Jan. 20, 1968, 43/3397
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **2 Claims**

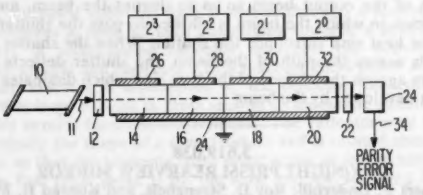
A fiber optics element comprising a pair of fiber optics assemblies connected in series, the side face of one assembly

being transparent, and provided with a half mirror between said two assemblies at an oblique angle to the optical path.



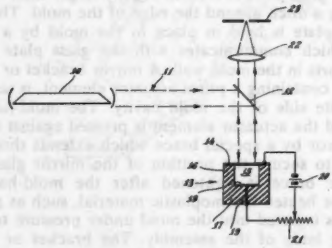
whereby the reflected image of an object disposed in close contact with the end face of said one assembly is derived from the side face thereof.

3,619,031
ELECTRO-OPTIC PARITY CHECKER
Juan Jose Amodei, Levittown, Pa., assignor to RCA Corporation
Filed Feb. 27, 1970, Ser. No. 15,009
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 **3 Claims**



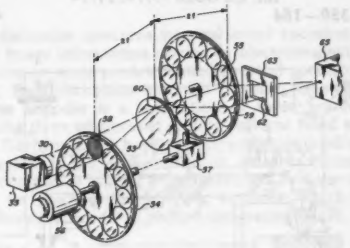
A parity checker is disclosed in which electrical signals representing "1" and "0" bits of an information word are supplied to optically aligned electro-optic polarization rotators. A polarized light beam directed through the rotators is rotated 90° an odd or an even number of times depending on whether there are an odd or an even number of 1's in the information word. An analyzer and a light detector receptive to the rotated beam provides an electrical indication of the parity of the information word.

3,619,032
TEMPORAL LIGHT MODULATOR USING DEFLECTABLE MEMBRANE
Fremont Reizman, Wilton, Conn., assignor to The Perkin-Elmer Corporation
Filed July 29, 1968, Ser. No. 748,517
Int. Cl. G02f *1/32*
U.S. Cl. 350—161 **7 Claims**



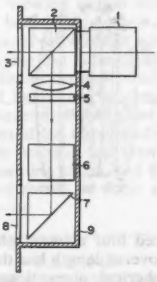
A system for modulating the amplitude of a beam of radiant energy which includes a reflective surface, a lens positioned to form a Fraunhofer diffraction pattern of a beam reflected from the surface, and a spatial filter located at the focal point of the lens. Means are provided for moving the reflective surface through a range of positions, so that the intensity at the center of the pattern varies from a maximum to a minimum. The filter is arranged to select only the central region as the output beam.

3,619,033
THREE-DIMENSIONAL LIGHT BEAM SCANNER UTILIZING TANDEMLY ARRANGED DIFFRACTION GRATINGS
Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation
Filed Sept. 25, 1968, Ser. No. 762,449
Int. Cl. G02b *5/18, 27/38*
U.S. Cl. 350—162 **3 Claims**



A light beam scanning apparatus including a rotatable disc having a plurality of focusing elements disposed in an annular or spiral pattern such that an impinging light beam is intercepted in succession by each of the focusing elements and deflected along a plurality of adjacent lines thereby providing, in accordance with the characteristics of the focusing elements, either a two-dimensional scan pattern oriented respectively transverse or parallel to the direction of the focused light or alternatively a three-dimensional scan pattern encompassing the areas of the orthogonal two-dimensional patterns.

3,619,034
COLOR SEPARATING OPTICAL DEVICE
Motoi Yagi, Zushi-shi, and Yasuo Takemura, Kawasaki-shi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Jan. 21, 1970, Ser. No. 4,543
Claims priority, application Japan, Jan. 25, 1969, 44/6120, Jan. 27, 1969, 44/6352
Int. Cl. G02b *27/14;* **H04n** *9/08*
U.S. Cl. 350—173 **7 Claims**



A color-separating optical device comprising a beam splitter for separating a light coming from an image pickup lens into a portion passing straight through said beam splitter and a remaining portion reflected thereby, a color stripe filter on which there is formed an image of reflected light, a

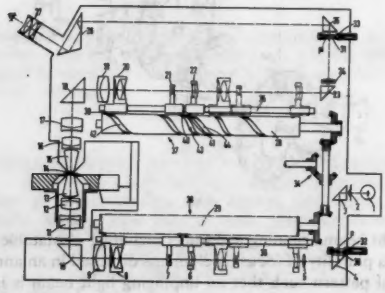
relay lens for receiving a light from said stripe filter and a means for reflecting a light from said relay lens in the same direction as that which previously passed straight through said beam splitter, thereby obtaining two parallel beams of light, and a lenticular lens interposed between said color stripe filter and beam splitter so as to reduce optical resolution conducted in a direction perpendicular to the stripes of said color stripe filter.

3,619,035

ZOOM LENS SYSTEM FOR MAINTAINING TWO PAIRS OF CONJUGATE PLANES FIXED

Harold Horace Hopkins, Barnet, England, assignor to W. Watson & Sons, Limited, Barnet, England

Filed Jan. 24, 1969, Ser. No. 793,701
Claims priority, application Great Britain, Jan. 25, 1968, 4026/68
Int. Cl. G02b *15/14, 21/14*
U.S. Cl. 350—184 **4 Claims**



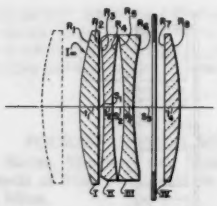
A zoom lends system has three movable lens components and means for moving each lens component relative to the other two in such a way that two pairs of conjugate planes remain fixed in position throughout the range of magnification. The zoom system may be used in zoom microscopes and phase contrast microscopy. One pair of fixed conjugate planes is used for object and image positions and the other pair for an aperture stop and phase-changing device. One such zoom system may be used between the objective and eyepiece and another in the substage assembly.

3,619,036

COMPACT FOUR ELEMENT PHOTOGRAPHIC OBJECTIVE LENS

James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 7, 1968, Ser. No. 774,141
Int. Cl. G02b *9/36*
U.S. Cl. 350—221 **25 Claims**



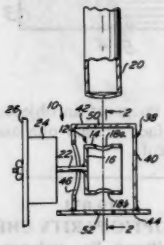
Compact airspaced four element photographic objectives are shown with an overall length less than ⅛ the focal length. Chromatic and spherical aberrations, coma, astigmatism, field curvature and distortion are corrected. The ratio of the minimum Abbe Y value of the first and fourth elements to the maximum Abbe Y value of the second and third elements (i.e., Baker's Ratio) is less than 1.2. The Petzval sum does not exceed 0.225. Focusing is accomplished by a movable first element.

3,619,037

A LASER BEAM SHUTTER INCLUDING A HEAT SINK

Alexander L. Pugh, Jr., Paoli, Pa., assignor to TRW Inc., Philadelphia, Pa.

Filed Sept. 19, 1968, Ser. No. 760,768
Int. Cl. G02f *1/30*
U.S. Cl. 350—269 **7 Claims**



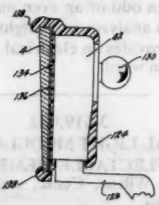
A control for disrupting and permitting the flow of the output beam of a laser to a workpiece. The control includes a shutter mounted in the path of the output beam and movable between a position in which the shutter extends across the path of the output beam so as to disrupt the beam, and a position in which the beam is allowed to pass the shutter. A metal heat sink surrounds the shutter. When the shutter extends across the path of the beam, the shutter deflects the beam against the surface of the heat sink which dissipates the heat developed by the beam.

3,619,038

DAY/NIGHT PRISM REARVIEW MIRROR

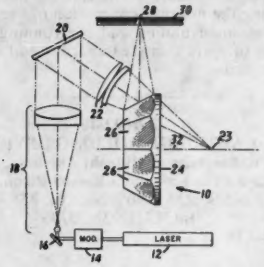
Robert E. Underhill; Roy D. Strengholt, and Konrad H. Marcus, all of Holland, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich., by said Underhill

Filed Sept. 11, 1967, Ser. No. 666,793
Int. Cl. G02b *5/08, 17/00*
U.S. Cl. 350—281 **4 Claims**



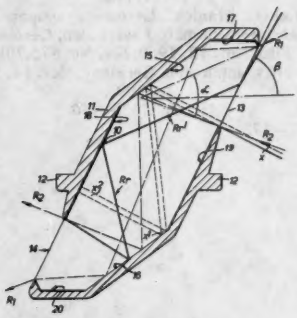
This disclosure relates to a glass mirror assembly, such as for example, a rearview mirror for an automobile. The mirror is produced by heating a reflective glass plate, and placing the heated glass plate in a mold slightly larger than the plate, and having a ditch around the edge of the mold. The reflective glass plate is held in place in the mold by a vacuum source, which communicates with the glass plate through vacuum ports in the mold wall. A mirror bracket or support, preferably containing a prism actuator element, is secured in the opposite side of the mold cavity. The mold-halves are closed, and the actuator element is pressed against the back of the mirror by a special brace which extends through the mold-half to secure the position of the mirror glass in the mold. The brace is tightened after the mold-halves are closed. The heated thermoplastic material, such as polyvinyl chloride, is injected into the mold under pressure to form a supporting body of the assembly. The bracket or actuator element has a flat surface which is coated with a thermoplastic material, preferably the same which is injected into the mold, and this coated surface contacts the mirror glass. The thermoplastic material is bonded to the mirror glass plate, preferably through an adhesive-promoting coating on the mirror plate.

3,619,039
LASER SCANNING SYSTEM INCLUDING ROTATING REFLECTOR
Leo Beiser, Flushing Manor, N.Y., assignor to Columbia Broadcasting System, Inc., New York, N.Y.
Filed June 19, 1968, Ser. No. 738,234
Int. Cl. G02b 17/00
U.S. Cl. 350—285 16 Claims



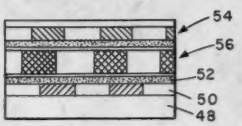
Collimated coherent light is passed through a lens which establishes a cone of light converging towards a first focal point. A multifaceted reflector intercepts the converging cone of light and redirects it to a scanning focal point. At the point where it is intercepted by the reflector, the cone of light is large enough in cross section to illuminate simultaneously several facets of the reflector. The reflector may have generally the shape of a cone frustum and is rotated about its axis so that the scanning focal point scans an image surface. The first focal point is on the axis, and the scanning focal point therefore describes a circular arc. The image surface is curved to conform to the arc. The collimated light travels in a direction which may be parallel to the rotor axis but which is preferably inclined to the axis in order to provide improved optical efficiency.

3,619,040
PRISM PERISCOPE
William Thomas Rickets, Kent, England, assignor to David Mark Cowan and Stanley Phillip Cowan, Trading in partnership as the Helio Mirror Company
Filed Sept. 10, 1969, Ser. No. 856,546
Int. Cl. G02b 5/04, 23/08
U.S. Cl. 350—286 2 Claims



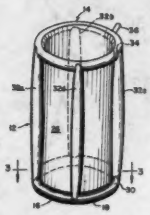
A periscope prism or a periscope installation including such a prism in which in order to avoid reflection from said prism back to the object under observation, the entry surface, any internally reflecting surfaces and the exit surface of said prism are arranged to be at angles other than right angles to the path of the light incident thereon.

3,619,041
SPECTRAL ZONAL ENCODER EMPLOYING A SILVER HALIDE EMULSION LAYER
David E. Willoughby, Leominster, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.
Filed Jan. 13, 1969, Ser. No. 790,656
Int. Cl. G02b 5/22
U.S. Cl. 350—311 2 Claims



This disclosure concerns spectral zonal encoders for impressing image information carried by electromagnetic radiation in one or more predetermined spectral zones on spatial carriers, and fabrication methods therefor. One illustrated multizone encoder is a lamination of three grating filters comprising three photoresist grating patterns filled with dye-vehicle filter materials having preferential absorption in different regions of the visible spectrum. Another illustrated encoder comprises a grating filter fabricated by color-coupling lines in an exposed photographic emulsion which is sandwiched between two filled photoresist-grating filters.

3,619,042
COLLAPSIBLE UNDERWATER VIEWING DEVICE
Sanford H. Lazar, 30 Fifth Ave., San Francisco, Calif.
Filed June 1, 1970, Ser. No. 42,194
Int. Cl. G02b 5/00, 7/00, 27/00
U.S. Cl. 350—319 4 Claims

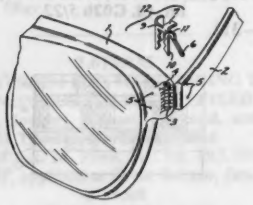


A collapsible and portable underwater-viewing device comprising confronting upper and lower tubular end sections having relatively thin flexible walls and inflatable to form relatively rigid rings, struts interconnecting the end sections to maintain the latter in spaced relationship to each other when in the inflated condition, a continuous flexible web of water-impermeable material secured to the end sections thus forming a protected viewing region when one end of the device is submerged below the surface of a body of water, and a transparent panel of flexible and foldable material secured to an overlaying the submergible end section, thus forming a viewing cylinder through which the user, after immersing the one end below the aforementioned water surface, may observe therethrough regions below such surface from the vantage point of the upper end section, the end sections being deflatable so that the latter, the web secured thereto, the interconnecting struts, and the transparent panel may be collapsed and folded to form a compact and conveniently portable device.

3,619,043
TEMPLE TENSIONER AND HINGE SCREW LOCKING DEVICE FOR EYEGLASSES
Howard Carlyle, 8420 Madison, South Gate, Calif.
Filed Sept. 22, 1969, Ser. No. 859,897
Int. Cl. G02b 5/16
U.S. Cl. 351—113 3 Claims

A temple tensioning and hinge screw locking device that is stamped and shaped from steel by a continuous die and then

tempered to make a permanent device which may be readily clipped onto the hinge portion of eyeglass frames and held in position either by spring clip action or by a screw, or both, becoming a permanent integral part of the eyeglasses, exerting inward pressure on the temple pieces which extend along the sides of the wearers head, holding the eyeglasses in the prescribed position at all times, and a temple hinge screw lock flange which rests on top of the hinge screw so that said screw cannot loosen or back out.



3,619,044

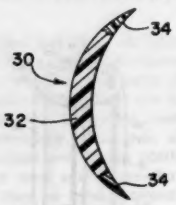
RIGID GAS PERMEABLE CONTACT LENS WITH SOFTER EDGE PORTION

Pandurang M. Kamath, East Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of application Ser. No. 815,322, Apr. 11, 1969, now Patent No. 3,551,035. This application Feb. 18, 1970, Ser. No. 12,378

Int. Cl. G02c 7/04

U.S. Cl. 351—160 **2 Claims**



A rigid, oxygen permeable contact lens formed of the plastic material poly (4-methyl pentene-1) with a soft swellable plastic grafted on the poly (4-methyl pentene-1) lens as the edge of the lens. Method of making such lenses.

3,619,045

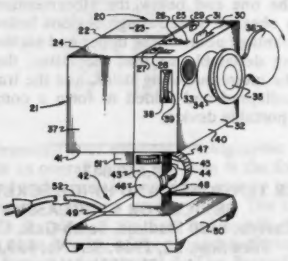
MOVIE FILM SOUND VIEWER

Otto R. Nemeth, Santa Monica, Calif., assignor to Anthony M. Frank and Charles A. Palmer, Calif., part interest to each

Filed July 8, 1968, Ser. No. 743,203

Int. Cl. G03b 31/02, 23/02

U.S. Cl. 352—27 **16 Claims**



A portable, self-contained movie film sound viewer includes a film transport component for moving film at a continuous rate past a sound-reproducing head, a film-advancing component for moving film intermittently at a variable rate past a viewing aperture, and a film movement sensor located between the film portions passing the sound-reproducing head and viewing aperture. The sensor is biased against the film to monitor film tension and forms a film loop whose optimum length corresponds with synchronous movement between the film portions being viewed and listened to. The sensor coacts with a mechanical servo to automatically correct out-of-phase motions of the film portions by increasing and decreasing the intermittent motion of the film-advancing component as underrunning and overrunning conditions occur. The use of sprockets customarily used for transferring film is eliminated.

3,619,046

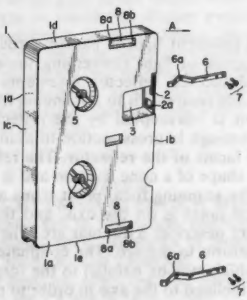
CARTRIDGE-HOLDING DEVICE

Tokusaburo Kakiuchi, and Hideaki Akiyama, both of, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Sept. 5, 1969, Ser. No. 855,625

Int. Cl. G03b 23/00

U.S. Cl. 352—78 **2 Claims**



Holding device for a film cartridge insertable into an opening cinematographic apparatus for projection position and rewind position. A click spring having a V-shape is mounted in the apparatus to extend into the opening. A corresponding recess is formed in the cartridge, and the click spring is engageable with edges of the recess in the two positions.

3,619,047

MOTION PICTURE CAMERA WITH FILM FRAME COUNTER

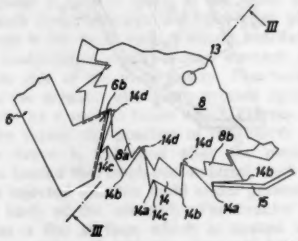
Karl Neudecker, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 12, 1969, Ser. No. 875,708

Claims priority, application Germany, Nov. 14, 1968, G 68 06 909

Int. Cl. G03b 1/60

U.S. Cl. 352—172 **10 Claims**



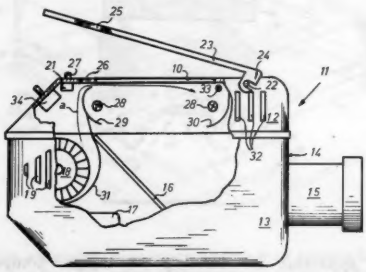
A frame counter for 8-millimeter motion picture film which comprises two coaxial toothed disks one of which is provided with indicia representing different numbers of film frames and the other of which has alternating deeper and

shallower tooth spaces. A pawl is driven by the film-transporting mechanism of the camera to repeatedly index the other disk and to index the one disk only when its pallet extends into a deeper tooth space.

3,619,048
EPISCOPE

Heinz Engert, Nurnberg; Gunter Kayser, Munich; Hans Lautenbacher, Munich; Siegfried Schafer, Munich, and Johann Weinhofer, Munich, all of Germany, assignors to Enna Werk Optische Anstalt Dr. Appelt K.G., Munich, Germany

Filed Aug. 13, 1969, Ser. No. 849,852
Claims priority, application Germany, Aug. 13, 1968, P 17 97 080.8
Int. Cl. G03b *21/16*
U.S. Cl. 353—61 **7 Claims**

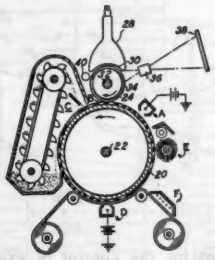


An episcope with a housing having a top mounted object support and a hinged cover over the object support. A high-intensity low-voltage lighting system with associated reflectors transfers a clear brilliant image into a projection lens system. The object support is a heat-insulating glass plate. A high-volume fan in the housing together with inlet and outlet apertures in the housing wall and flow guides inside the housing maintain a boundary layer of cooling air flow across the underside of the object support. Controls for the high-intensity lighting system are interrelated with the object support area so projection lighting is on only when the cover is down or an object on the support engages a switch. A magnetic latch maintains the cover in its lowered position.

3,619,049
XEROGRAPHIC IMAGERY USING A LONG PERSISTENCE PHOSPHOR INTERMEDIATE

Gary K. Starkweather, and Richard M. Bobbe, both of Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 663,805, Aug. 8, 1967, abandoned. Filed Mar. 16, 1970, Ser. No. 19,587
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 **1 Claim**

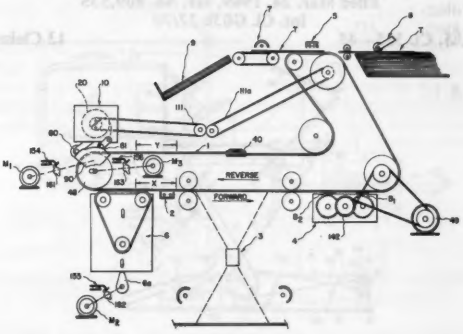


Apparatus for placing an image on a photoreceptor by exciting a phosphorescent intermediate which then contacts the photoreceptor causing an image in the pattern of the excited phosphors on the intermediate. Apparatus may be added for viewing the image formed on the intermediate. By use of a long persistence phosphor, the intermediate is capable of several exposures on the photoreceptor though it is excited only once.

3,619,050
WEB-HANDLING APPARATUS AND CARTRIDGE AND WEB USABLE THEREWITH

Thaddeus Swanke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 19, 1969, Ser. No. 834,695
Int. Cl. G03g *15/00;* **B65h** *19/18*
U.S. Cl. 355—16 **44 Claims**

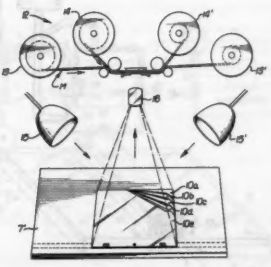


An electrophotographic machine using an electrophotosensitive web which is adapted to be driven through an endless path is provided with a device for replacing a used web with a new one. The device is adapted to remove a used web, receive a cartridge containing a new web and position the leading edge of the new web for threading in the apparatus. The leading web end is picked up by a towbar, threaded through the machine and spliced to form a continuous belt. When replacement again is desired, the device separates the web and feeds the web back into the cartridge for disposal. A particular web and web-cartridge combination usable in such apparatus and a mechanism for handling such web and cartridges are also disclosed.

3,619,051
PRODUCTION OF COLOR FILMS FROM MONOCHROMATIC FILM

Norman H. Wright, San Clemente, Calif., assignor to Norman Wright Productions, Inc., Laguna Niguel, Calif.

Filed Oct. 23, 1969, Ser. No. 868,716
Int. Cl. G03b *27/76*
U.S. Cl. 355—32 **8 Claims**



Relates to a method of converting exposed and developed monochromatic motion picture strip film (generally of live action) into colored versions thereof. Method includes the steps of projecting and enlarging frames of the monochromatic strip film to produce enlarged images of each frame in step by step succession; a plurality of transparent cells are produced for each frame so projected, each cell carrying a different color, each color being correlated to a selected

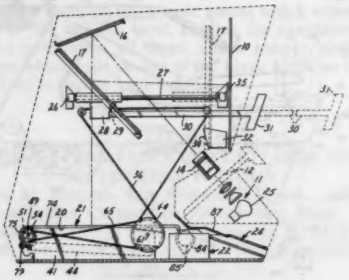
image component of the projected and enlarged frame and the placement of the component therein; colored cells for each frame are them assembled in superimposed relation and photographed on unexposed color film, the original monochromatic live action film being between the assembled cells and the color film, the monochromatic master imparting detail and shading to and outlining areas of color in the color impressions received from the cells by the color film. Various types of color film and cell paints can be employed.

3,619,052

MICROFILM READER PRINTER

Wolodymyr Diachuk, Columbia Heights, and Thomas A. Turgeon, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 24, 1969, Ser. No. 809,535
Int. Cl. G03b 27/70
U.S. Cl. 355—45 13 Claims



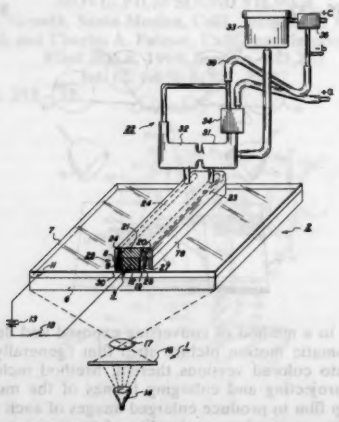
This invention is a low-cost microfilm reader printer which uses sheet form print material. The invention utilizes a sheet-feeding mechanism having a compressible dispensing roll in contact with one end of a stack of sheet print material, and a guide-disposed adjacent the periphery of the roller. When rotated, the dispensing roller separates sheet in the stack and feeds successive sheets between the roller and the guide approximately 180° around the roller and directs the dispensed sheet to an exposure station above and parallel to the storage area. Subsequent to exposure, the exposed sheet is advanced to a developer.

3,619,053

PHOTOELECTROPHORETIC IMAGING SYSTEM

Kallis H. Mannik, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,622
Int. Cl. G03g 15/00
U.S. Cl. 355—3 12 Claims



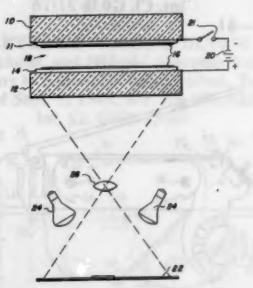
A photoelectrophoretic system is disclosed which utilizes a pneumatic operated circuit to apply an imaging suspension onto injecting and blocking electrodes, to control the agitation of the ink between the electrodes and to remove excess ink from the electrodes. The blocking electrodes are either a skid-type member or a roller-type member with both being supported to make contact with an injecting electrode.

3,619,054

OIL FILM IMAGING APPARATUS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 571,343, Aug. 9, 1966. Filed Jan. 16, 1970, Ser. No. 8,134
Int. Cl. G03g 15/14
U.S. Cl. 355—16 6 Claims



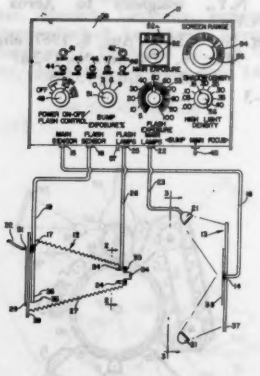
An apparatus for forming an image, comprising a photoconductive insulating layer having a thin liquid film thereon and separated from an electrode by a small gap. After an electrical field has been established between the photoconductive layer and the electrode, the photoconductive layer is selectively illuminated causing liquid transfer in imagewise configuration onto the electrode. An image is also formed on the photoconductive insulating layer. Alternately, a thin liquid film is applied to both the photoconductive insulating layer and the electrode or solely to the electrode.

3,619,055

EXPOSURE CONTROL DEVICE

Harold Brent Archer, Pittsford, N.Y., and Charles R. Williams, Wheaton, Ill., assignors to Sargent-Welch Scientific Company, Chicago, Ill.

Filed June 5, 1969, Ser. No. 830,689
Int. Cl. G03b 27/76
U.S. Cl. 355—69 14 Claims



An instrument for the control of exposure in halftone photography is described which instrument automatically compensates for variations in light sources and variations in flare conditions in the camera. A main lamp sensor and integrator means measures the cumulative illumination produced by the main lamp and flash lamp sensor and integrator means measures the cumulative flash illumination,

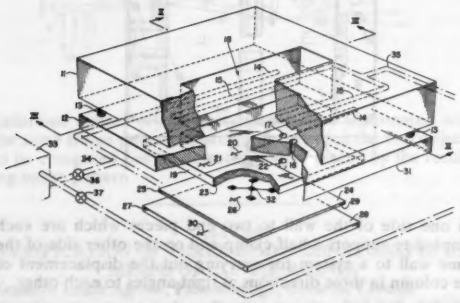
including flare. Exposure of the main and flash lamps is terminated when the proper amount of light for an exposure is reached, based upon preset calibrations for the camera conditions and the type of work to be done.

3,619,056

PATTERN REGISTERING JIG

Gerald Hermann Hantusch; David Alfred Vincent, and Eric Henry Van Tongerloo, all of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 28, 1970, Ser. No. 75,828
Int. Cl. G03b *27/20*
U.S. Cl. 355—91 **5 Claims**



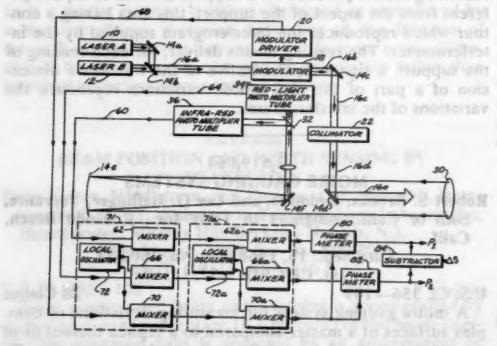
A jig for accurately registering an image or pattern bearing mask on one face of a silicon slice with an existing pattern on the opposite face of the silicon slice. The face of the silicon slice which bears the existing pattern is initially registered with, placed in contact with, and held by a supporting face of a vacuum chuck. This initial registration is performed by sighting through an optically transparent portion of the chuck body and registering corresponding reference and registration marks on the silicon slice and the chuck body respectively. Following this initial registration image bearing mask is placed on the opposite face of the silicon slice so as to form a sandwich of the vacuum chuck body, silicon slice and image bearing member. When the image bearing member has also been registered with the vacuum chuck body, by sighting through the aforementioned transparent portion and aligning corresponding registration marks, the pattern bearing mask will be correctly registered with the existing pattern on the opposite face of the silicon slice.

3,619,057

GEODETIC LASER SURVEY SYSTEM

Vito E. Castellano, Orange; Edward L. Cohn, La Mirada, and Robert A. Fowler, Torrance, all of Calif., assignors to North American Aviation, Inc.

Filed June 28, 1967, Ser. No. 649,513
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **5 Claims**



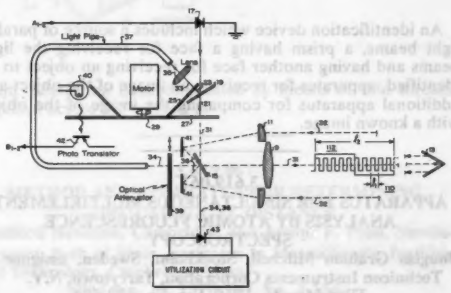
Apparatus—comprising a pair of light-sources whose beams are combined, modulated, and directed to a distant retroreflector—that measures the phase-shift of the modulations on the reflected light beams in order to measure the index-of-refraction of the atmosphere and the movement, if any, of the retroreflector.

3,619,058

DISTANCE MEASURING APPARATUS

William R. Hewlett, Palo Alto, and Gregory Justice, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 24, 1969, Ser. No. 879,291
Int. Cl. G01r *25/00*; G01c *3/08*
U.S. Cl. 356—5 **11 Claims**



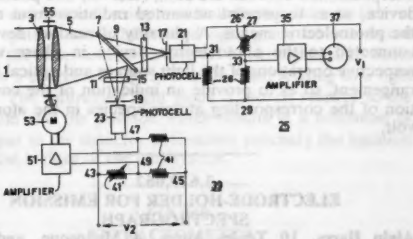
The phase of a modulated light carrier signal that is transmitted to and reflected back from a distant reflector is compared with a reference modulated light carrier signal to provide a direct readout of distance to the reflector. The reference and reflected light carrier signals are chopped alternately and measured in a signal circuit that reconstructs the phase information on the chopped signals for continuous analysis and readout directly in distance.

3,619,059

COLOR TEMPERATURE MEASURING PROCESS AND APPARATUS

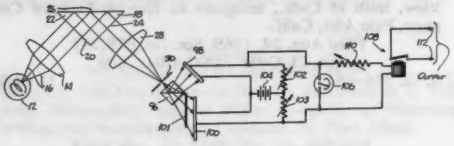
Peter Muller, Ruhpolding, and Ernst Guilino, Munich, both of Germany, assignors to Institut fur Plasmaphysik G.m.b.H., Munich, Germany

Filed Aug. 6, 1969, Ser. No. 848,002
Claims priority, application Germany, Aug. 7, 1968, P 17 97 032.0
Int. Cl. G01j *5/60, 3/42*
U.S. Cl. 356—45 **15 Claims**



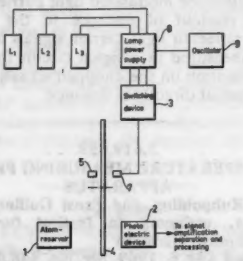
The color temperature of the radiating body is measured by separately measuring photoelectrically two different wavelength ranges of a beam emanating from the body, while the intensity of the beam is adjusted by an attenuating device so that the two different wavelength ranges are affected substantially the same and one of the wavelength ranges is maintained at a predetermined intensity.

3,619,060
IDENTIFICATION DEVICE
Joseph E. Johnson, Physics Department, University of S.C., Columbia, S.C.
Filed Nov. 19, 1968, Ser. No. 777,117
Int. Cl. G01b 9/08
U.S. Cl. 356—71 22 Claims



An identification device which includes a source of parallel light beams, a prism having a face for receiving the light beams and having another face for receiving an object to be identified, apparatus for receiving an image of the object and additional apparatus for comparing the image of the object with a known image.

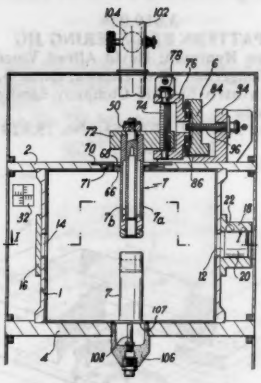
3,619,061
APPARATUS FOR SIMULTANEOUS MULTIELEMENT ANALYSIS BY ATOMIC FLUORESCENCE SPECTROSCOPY
Douglas Graham Mitchell, Stockholm, Sweden, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed May 26, 1969, Ser. No. 827,554
Claims priority, application Sweden, May 27, 1968, 7083/68, Jan. 24, 1969, 1006/69
Int. Cl. G01n 21/52; G01j 3/00
U.S. Cl. 356—85 11 Claims



Apparatus for multielement atomic fluorescence spectroscopy comprising an atom reservoir containing at least two atomic species and a plurality of light sources which are sequentially operated to excite atomic fluorescence radiation from each of the atomic species, in turn, for detection by a same photoelectric device. An optical filter arrangement is interpositioned between the atom reservoir and photoelectric device, so as to prevent unwanted radiation from reaching the photoelectric means. A plurality of readout devices are connected to the photoelectric device in phase with the respective operations of the light sources and optical filter arrangement, so as to provide an indication of the concentration of the corresponding atomic species in the atom reservoir.

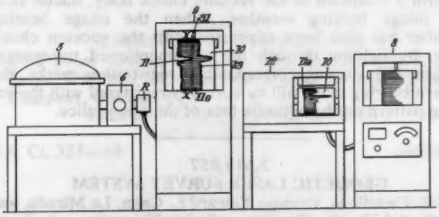
3,619,062
ELECTRODE-HOLDER FOR EMISSION SPECTROGRAPH
Alain Heres, 10 Toules Aures, 4 Manosque, and Alfred Simenauer, Villa n° 28 le Petit, Nice 13 Aix en Provence, both of France
Filed Apr. 29, 1970, Ser. No. 32,898
Claims priority, application France, May 9, 1969, 6915076
Int. Cl. G01j 3/02
U.S. Cl. 356—86 5 Claims

In order to permit very accurate centering of electrodes which are intended to support samples for the purpose of spectrometric analysis, the invention provides an electrode holder comprising a column which is adapted to slide within the wall of an excitation chamber. The column is connected



on one side of the wall to two end pieces which are each adapted to support a half clamp and on the other side of the same wall to a system for carrying out the displacement of the column in three directions at right angles to each other.

3,619,063
SPECTROMETER FOR THE FAR INFRARED
Armand Hadni, Nancy; Robert Thomas, Saint-Die, and Jacques Weber, Verdun, all of France, assignors to Centre National De La Recherche Scientifique, Paris, France
Filed Sept. 24, 1968, Ser. No. 761,997
Claims priority, application France, Sept. 29, 1967, 122823
Int. Cl. G01b 9/02
U.S. Cl. 356—106 6 Claims

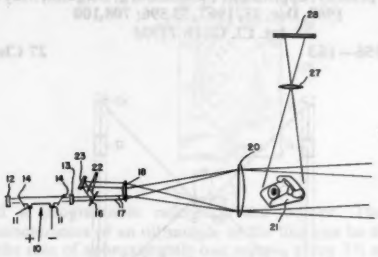


The spectrometer comprises a Michelson interferometer, recording means, reading means and a wave analyzer. The recording means produce on a support an area of aspect different from the aspect of the support, this area having a contour which reproduces the interferogram supplied by the interferometer. The reading means deliver, for each reading of the support, a signal representative of the transverse dimension of a part of the area whose variations reproduce the variations of the interferogram.

3,619,064
MOIRE GAUGING SYSTEMS
Robert S. Brooks, Redondo, and Lee O. Heflinger, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Sept. 18, 1968, Ser. No. 760,572
Int. Cl. G01b 9/02, 11/10
U.S. Cl. 356—109 28 Claims

A moire gauging system for measuring deviations of complex surfaces of a master compared to a replica thereof or of a master compared to a deformed or vibrating master. To this end, optical fringes are generated interferometrically to project substantially plane sheets of light parallel to each

other onto the object to be measured. There fringes on the master can be recorded photographically or by creating a hologram, for example, and compared to the replica, or



deformed master or the like which is also illuminated with the same fringe pattern. Distinctions between the two objects to be compared can be detected and measured by the resulting moire pattern.

3,619,065

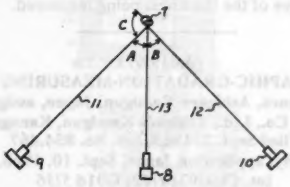
VERIFICATION OF THREE-DIMENSIONAL SHAPES BY MEANS OF CONTOUR LINES

Kenneth Leslie Agnew, Falconbridge, Ontario, Canada

Continuation-in-part of application Ser. No. 293,729, July 9, 1963, now abandoned. This application July 29, 1967, Ser. No. 687,078

Int. Cl. G01b *11/30, 11/24*

U.S. Cl. 356—120 **2 Claims**



This invention relates to an optical method of subsequently verifying similarity of shape of a three-dimensional object, or its reproduction, previously recorded on a two-dimensional record, such as a photograph. A projector, the shape, and a recording device are arranged in a plane, the straight lines connecting them in the aforesaid order forming a V with the shape at the intersection of the two arms of the V. Distortion of the initially projected lines (which must be at a substantial angle to the central plane of the V), produced by reflection from a master pattern, is either eliminated or reproduced by subsequent shapes, if similar, depending on the direction of the path of reprojection around the V. In some cases, distortion of the lines may be obtained by calculation rather than by actual reflection from a master pattern.

3,619,066

BEAM POSITION AND WIDTH SENSING BY SCATTERING

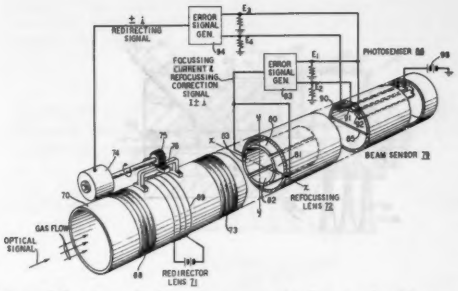
Peter Kaiser, Middletown, and Enrique A. J. Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 7, 1969, Ser. No. 805,201

Int. Cl. G01j *1/42*; G02b *5/14*

U.S. Cl. 356—122 **9 Claims**

Beam position and beam width sensing is accomplished by scattering a small percentage (0.1 percent) of the beam energy. The scattered light is analyzed by an arrangement of three photosensors that compare the energy distribution along different portions of the beam and produce appropriate error signals which are then used to reposition and focus the



beam. Scattering is accomplished by means of thin threads disposed across the wavepath.

3,619,067

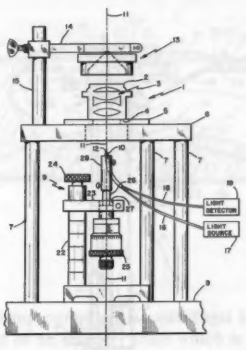
METHOD AND APPARATUS FOR DETERMINING OPTICAL FOCAL DISTANCE

Bradford Howland, Cambridge, and Arthur F. Proll, Newburyport, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 19, 1970, Ser. No. 4,154

Int. Cl. G01b *9/00*; G02b *5/14*

U.S. Cl. 356—125 **17 Claims**



The location of the focal surface of a lens system is precisely determined, using a retroreflector on one side of the lens system and a bifurcated light guide of intermixed fibers on the other side, with one set of the light guide fibers leading to a source of light and another set leading to a light detector. The bifurcated light guide is moved relative to the lens system and the position which results in a minimum of light output to the detector determines precisely the location of the focal surface of the lens system.

3,619,068

REFRACTOMETER

Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company

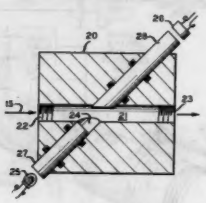
Filed Aug. 28, 1969, Ser. No. 853,702

Int. Cl. G01n *21/46*

U.S. Cl. 356—130 **5 Claims**

A refractometer is formed by a housing having two intersecting passages therethrough. The fluid to be tested is

passed through the first passage, and a radiation beam is passed through the second. A bundle of light tubes is positioned in the second passage so that one end of the bundle is



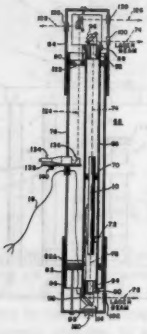
disposed in the test fluid at an angle with the axis of the tube bundle. A radiation detector measures the radiation passed through the tube bundle.

3,619,069

OPTICAL ALIGNMENT METHOD AND MEANS UTILIZING COORDINATED LASER BEAMS AND LASER BEAM COORDINATING MEANS FOR SAME

John Alexander, Wilmington, Del., assignor to Technidyne, Inc., Wilmington, Del.

Division of Ser. No. 717,067, Mar. 12, 1968, which is a continuation-in-part of application Ser. No. 632,279, Apr. 20, 1967, now abandoned. Filed Apr. 21, 1969, Ser. No. 817,872
Int. Cl. G01b *11/27*
U.S. Cl. 356—138 **12 Claims**



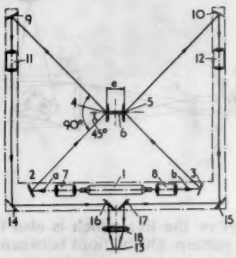
A laser projection device is provided which includes a tubular housing having a lasing chamber and symmetrically disposed optics at each end of the housing and chamber, effecting propagation of laser beams from each end of the housing in opposed straight line relationship. Another embodiment includes an additional outer housing having beam bending pentaprism optics for projecting the initially opposed laser beams in parallel planes and at least one beam splitting device for creating opposed beams in straight line configuration from at least one of the initially opposed beams in at least one of the parallel projection planes. The pentaprism optics are adjustable to effect either parallel or predetermined skew orientation of the several beams in the projection planes. Both embodiments are provided with telescopes or other optical viewing devices for determining a condition of impingement of the laser beams on a remote target by the visual detection of a red glow emitted from such a target when such an impingement occurs.

3,619,070

METHOD AND APPARATUS FOR MEASURING THICKNESS

Robert Alfred Pirlet, Angleur, Belgium, assignor to Centre National De Recherches Metallurgiques, Brussels, Belgium

Filed May 6, 1968, Ser. No. 726,946
Claims priority, application Luxembourg, Belguim, May 5, 1967, Dec. 15, 1967, 53,596; 708,100
Int. Cl. G01b *11/06*
U.S. Cl. 356—163 **27 Claims**



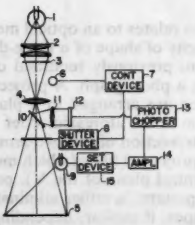
A method for measuring the thickness of a body, characterized in that on each side of the body whose thickness is to be measured one point is selected, the points being situated on a common normal to the median plane of the material or substantially in proximity to such a normal, these two points being such that the planes tangential to the walls of the body at these points are substantially parallel. Optical rays are directed towards each of these points, and a high proportion of the rays emanating from these points are collected in the form of two distinct beams. These beams are subsequently oriented towards a common plane and the distance between the images resulting from the intersection of these beams with the plane is measured by a suitable means, this distance being indicative of the thickness being measured.

3,619,071

PHOTOGRAPHIC-GRADATION-MEASURING DEVICE

Tsutomu Kimura, Ashigara-Kamigun, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara Kamigun, Kanagawa, Japan

Filed Sept. 2, 1969, Ser. No. 854,467
Claims priority, application Japan, Sept. 10, 1968, 43/65149
Int. Cl. G01j *1/42*; **G01d** *5/36*
U.S. Cl. 356—222 **5 Claims**



A mosaic of photosensitive elements acts in conjunction with a photochopper to provide a varying electrical signal indicative of the gradation contrast of a photographic negative image projected on the elements.

3,619,072

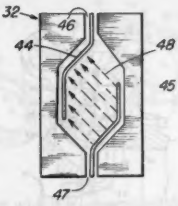
FLUID SAMPLE CELL WITH QUICK PURGING MEANS

John P. O'Hara, Staten Island, and Robert K. Siegfriedt, Merrick, both of N.Y., assignors to Mobil Oil Corporation

Filed Mar. 24, 1969, Ser. No. 809,878
Int. Cl. G01n *21/26*
U.S. Cl. 356—246 **7 Claims**

An automated infrared analysis apparatus having an improved sample cell which has grooves therein for quicker

purging of a sample, a chart drive mechanism which quickly skips over predetermined portions of the infrared spectrum



and a programable reference cell holder. The infrared characteristics of an oil sample or the like can be determined at the rate of approximately one sample every 3½ minutes.

3,619,073

SAMPLE HOLDER FOR OPTICAL MEASUREMENTS AT LOW TEMPERATURES

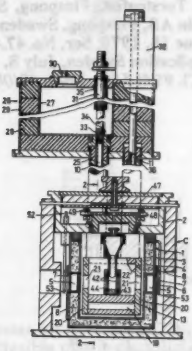
Michel Ossona De Mendez, 26 Rue Coriolis, 75 Paris (12°); Albert Foucard, 40 Chemin de Meaux, 93 Gagny, and Jacques Verin, 15 Rue Feron, 95 Montmorency, all of France

Filed Nov. 25, 1969, Ser. No. 879,797

Claims priority, application France, Dec. 2, 1968, 176,183

Int. Cl. G01n *1/10*

U.S. Cl. 356—246 **15 Claims**



A sample-holding apparatus for carrying out optical measurements at low temperatures, comprising a block forming a heat reservoir which includes a cavity of tapered cross section, a container for a sample, the shape of which is matched to that of the cavity to permit transfer of heat by contact between the block and the container even when the container is initially at a higher temperature than the block and contracts as it cools, a heating device, and a cooling device for said block, and a temperature control device for controlling the heating and cooling devices.

3,619,074

FOUNTAIN BRUSH AND VALVE THEREFOR

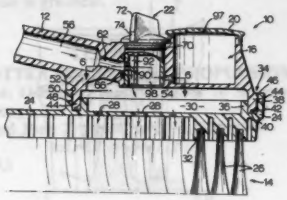
Janusz Morawski, Toronto, Ontario, Canada, assignor to Trixie Corporation Limited, Toronto, Ontario, Canada

Filed July 15, 1970, Ser. No. 55,046

Int. Cl. A46b *1/06*

U.S. Cl. 401—46 **7 Claims**

The body of a fountain brush has a chamber with exit holes surrounded by the projecting bristles. The body is connected to a hollow handle through which water is supplied; the body also has a well exterior of the chamber but also connected thereto. A three-way valve controls the flow of liquid not only from the hollow handle into the chamber and through



the exit holes but also the supply of liquid detergent contained in the well.

3,619,075

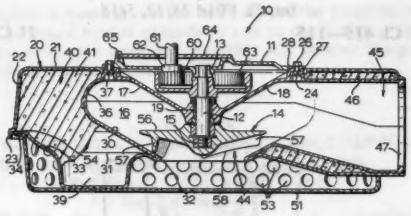
FLOATING PUMP

Walter F. Chmela, Willowdale, Ontario, Canada, assignor to Watermaster Industries Limited, London, Ontario, Canada

Filed Nov. 3, 1969, Ser. No. 873,282

Int. Cl. F01d *25/28*

U.S. Cl. 415—7 **7 Claims**



A floatable pump comprises a centrifugal impeller keyed to the lower end of an impeller shaft which is journaled in a bearing plate. To permit ready disassembly of the pump and withdrawal of the impeller assembly therefrom, the bearing plate and a pumping chamber cover member disposed around the impeller shaft between the impeller and the bearing plate are both detachably secured within an opening in the top surface of the pump housing. Such an opening is dimensioned so as to permit direct withdrawal of the impeller assembly therethrough.

3,619,076

LIQUID-COOLED TURBINE BUCKET

Paul H. Kydd, Scotia, N.Y., assignor to General Electric Company

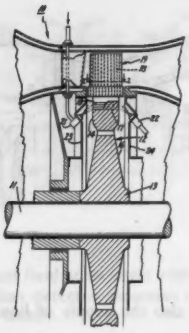
Filed Feb. 2, 1970, Ser. No. 7,805

Int. Cl. F01d *5/14*

U.S. Cl. 415—115 **5 Claims**

Turbine blade construction is described providing for the uniform distribution of cooling liquid to eliminate significant temperature gradients over the blade surface. Each blade consists of a central airfoil-shaped spar clad with a sheet of metal having a very high thermal conductivity e.g. copper.

The cladding sheet has grooves recessed in the sheet face adjacent the spar, which grooves together with the surface of the spar define coolant passages distributed over the surface as dictated by the cooling requirements.



3,619,077

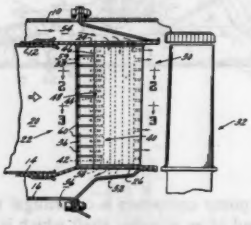
HIGH-TEMPERATURE AIRFOIL

George J. Wile, Hamilton, Ohio, and Herbert Garten, Swampscott, Mass., assignors to General Electric Company

Continuation of application Ser. No. 334,524, Dec. 30, 1963, now abandoned. This application Sept. 30, 1966, Ser. No. 584,056

Int. Cl. F01d *25/12, 5/18*

U.S. Cl. 415—115 11 Claims



A turbomachinery airfoil includes a plurality of stacked wafer elements which form at least a portion of the outer airfoil surface and are adapted to receive cooling fluid from a main support member.

3,619,078

CENTRIFUGAL GAS COMPRESSOR

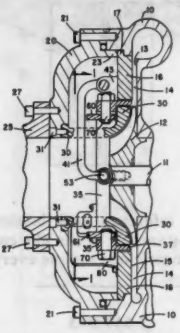
Gordon L. Mount, West Monroe, and James W. Endress, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed June 22, 1970, Ser. No. 48,358

Int. Cl. F04d *27/00, 15/00*

U.S. Cl. 415—150 3 Claims

The annular diffuser valve of the centrifugal compressor is supported on two pairs of links or bars. One pair is disposed normal to the other pair. Like ends of the links are pivotally connected to the machine casing. The opposite ends of the links of each pair are pivotally connected to the valve at diametrically opposite sides thereof, whereby the valve is held concentric with the impeller for free linear movement across the diffuser passage. Power means is provided for imparting such linear movement to the valve.



3,619,079

GUIDE BLADE MOUNTING MEANS FOR STEAM OR GAS TURBINES

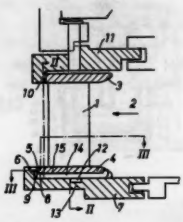
Ragnar Nils Anders Torstenfelt, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed June 18, 1970, Ser. No. 47,434

Claims priority, application Sweden, July 8, 1969, 9656/69

Int. Cl. F04f *5/48;* F04b *49/00*

U.S. Cl. 415—189 3 Claims



A mounting means for the guide blades of a steam or gas turbine comprising an inner ring to which each blade is axially locked by means of crossed bars which respectively extend across the ring and through a shroud which is secured to an end of the blade. The crossbars extend at an angle with respect to one another and by the selection of crossed bars having different degrees of angularity, replaced blades can be set in various angular positions to meet different requirements.

3,619,080

CENTRIFUGAL FAN HOUSING

Charles E. Bullock, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

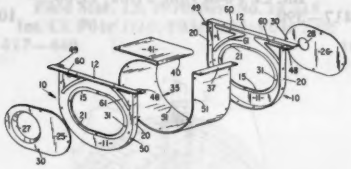
Filed Jan. 21, 1970, Ser. No. 4,652

Int. Cl. F04d *29/40, 29/00*

U.S. Cl. 415—219 5 Claims

The centrifugal fan housing consists of not more than five parts, two of which are duplicate parts, which may be assembled with the inlet bell at either end of the housing and with

the scroll located to provide for clockwise rotation or counterclockwise rotation of the fan. This arrangement provides a



universal fan housing which is assembled from identical parts to suit any installation.

3,619,081

BEATER FOR COMESTIBLES AND THE LIKE

Casimir F. Gruska, Chicago, and William Lelyk, Medinah, both of Ill., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 881,972
Int. Cl. B01f *7/16, 9/12*
U.S. Cl. 416—70 **2 Claims**

A one-hand beater for comestibles and the like is provided with a relatively flexible plastic mixing element having mixing fingers, each of which radiates outwardly and upwardly from a hub and terminates spaced apart from said hub at its top end, and means for more simply, efficiently and economically securing a shaft to the handle of the beater.

3,619,082

TURBINE BLADE

George B. Meginnis, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 5, 1968, Ser. No. 742,900
Int. Cl. F01d *5/08, 5/18*
U.S. Cl. 416—90 **16 Claims**

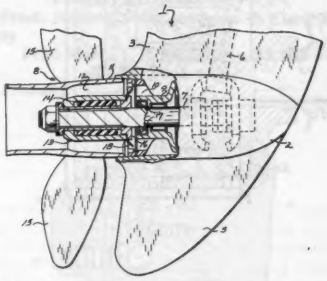
A turbine rotor blade of laminated porous metal cast into a base includes an inner reinforcing layer which has increasing porosity in the direction spanwise of the blades so that the strength diminishes with load in the spanwise direction and the porosity provides for flow of air to the porous blade wall. Pores or relieved areas in some sections of some layers are elongate and disposed with their long dimension spanwise of the blade for increased strength in this direction, in which stress in the blade is greatest.

3,619,083

FISHLINE CUTTER FOR MARINE PROPULSION UNITS

Wilbur E. Witte, Oshkosh, Wis., assignor to Brunswick Corporation, Chicago, Ill.

Filed June 2, 1969, Ser. No. 829,370
Int. Cl. B63h *1/20*
U.S. Cl. 416—93 **2 Claims**



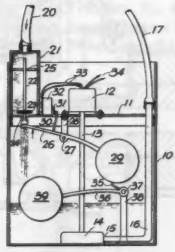
A cutter is mounted on the inner end of the propeller hub of an outboard marine propulsion unit to cut fishlines which become entangled upon the propeller and protect the gear-case seal from damage by the line.

3,619,084

WATER SUPPLY AND PUMP FOR FOUNTAINS

Harold L. Gordon, 1529 First St., Youngstown, Ohio

Filed Aug. 3, 1970, Ser. No. 60,457
Int. Cl. F04b *49/04*
U.S. Cl. 417—40 **3 Claims**



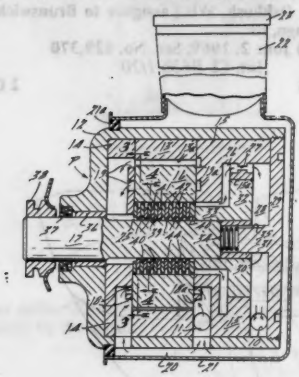
A water supply and pump for fountains is disclosed which includes a cylindrical container for holding the water supply, pump means for moving the water supply from the container to a fountain and means for returning the water from the fountain to the container controlled by a float valve responsive in operation to the level of water in the container, a secondary float valve biases the first float valve to effect a cycle in the pumping action and switch means controlled by the first float valve controls the pumping means.

3,619,085

HYDRAULIC PUMP

Christopher Nuss, Warren, and Thomas A. Phillips, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 1, 1969, Ser. No. 812,211
Int. Cl. F04b 1/26, 49/00
U.S. Cl. 417—223 11 Claims



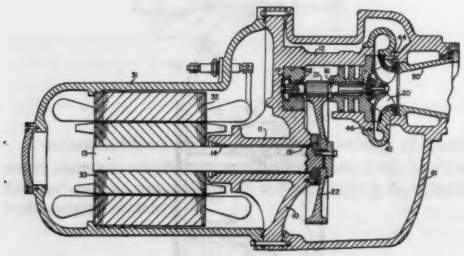
The fluid pressures at opposite sides of a metering orifice in the outlet of a hydraulic pump are employed to regulate the power operating the pump and, in cooperation with the size of the orifice, to predetermine the volume output of the pump.

3,619,086

SELF-CONTAINED CENTRIFUGAL REFRIGERANT GAS COMPRESSOR AND ELECTRIC MOTOR

John G. Johnson, Waynesboro, Va., and James H. Anderson, York, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1970, Ser. No. 14,469
Int. Cl. F04b 17/00, 35/04; F01d 15/12
U.S. Cl. 417—360 7 Claims



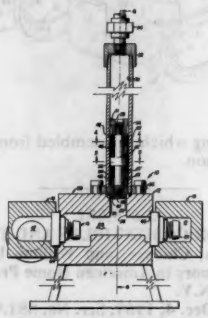
A self-contained electric motor-driven refrigerant gas compressor assembly is comprised of a bearing support member having a first cantilevered bearing assembly support means projecting from its back side with an electric motor armature shaft journaled therein and a second cantilevered bearing assembly support means projecting from its front side with a centrifugal gas impeller and shaft journaled therein. The armature shaft projects through the support member to its front side and suitable means for rotatably interconnecting the projecting armature shaft and the impeller shaft is provided on the front side.

3,619,087

FREE PISTON-TYPE PUMP

Archie W. Beeman, Box 245, Odessa, Tex.

Filed Dec. 17, 1969, Ser. No. 885,843
Int. Cl. F04b 9/08, 21/02, 17/00
U.S. Cl. 417—390 10 Claims



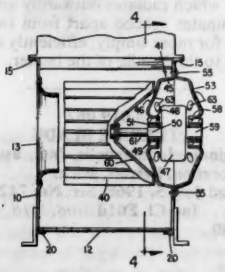
A free piston-type pump having two or more cylinders with each cylinder being connected to a chamber and a free piston being reciprocatingly received therein. Each chamber is connected to a common inlet and outlet manifold. A fluid to be pumped is connected to the inlet manifold by a pump which provides a low positive pressure therein, while a high-pressure power fluid is connected to an opposite side of the piston so as to reciprocate the piston with great force in one direction while the fluid to be pumped reciprocates the piston with a lesser force in an opposite direction. Hydraulic flow control means connected to a plurality of such cylinders provides uninterrupted use of the power fluid by continuously downstroking one piston while another piston is on the upstroke.

3,619,088

SINGLE INLET CENTRIFUGAL FAN

Charles E. Bullock, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 17, 1970, Ser. No. 12,005
Int. Cl. F04b 17/00; F04d 17/08
U.S. Cl. 417—423 3 Claims

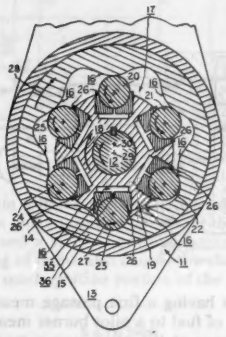


The invention relates to single inlet centrifugal blowers or fans. The fan is of less axial length than the width of the housing. The rear closed end wall of the housing confronting the backwall of the fan is provided with an inwardly extending cylindrical surface of substantially the same diameter as the fan and terminating in close spatial relation to the backwall of the fan. The cylindrical surface may be formed integral with the closed housing wall, or as a separate piece attached to the housing wall, or as part of the motor mount. The cylindrical surface serves to direct secondary rotational airflow from the space or cavity between the fan backplate and the rear wall of the housing.

3,619,089
FLUID-PRESSURE DEVICE

Michel A. Pierrat, Andover, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.

Filed Mar. 13, 1970, Ser. No. 19,315
Int. Cl. F01c *1/10*; F03c *3/00*; F04c *1/06*
U.S. Cl. 417—440 16 Claims

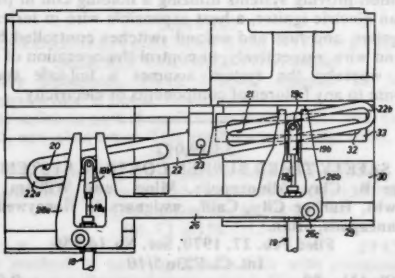


A fluid-pressure device, operated as a pump, motor, or the like, and including cooperating inner and outer gear portions which are angularly movable in relation to one another, is caused to make tight line-contact sealing for entrapped fluid, by way of a plurality of pressure-actuated sealing rollers which exhibit only low levels of friction confined to limited sealing intervals during rotational cycles. In a fluid pump construction, based in part upon a known design in which the inner and outer gear portions have different numbers of teeth and in which the resulting tooth contacts function to prevent fluid leakage between spaced teeth, the outwardly projecting teeth of the inner gear portion are formed by cylindrical rollers radially pressurized into tight rolling line contact with surfaces of the surrounding internally toothed gear portion at selected intervals as the result of commutator-type valving of the fluid-pressures developed by the pump. Manufacturing tolerances are relatively noncritical, because of the dynamic operations of the roller teeth, and the outer gear portion, rollers, and pressure-applying inner gear support structure for the rollers, all possess axial symmetries which enable them to be manufactured conveniently and economically by separations from elongated extrusions, and the like.

3,619,090
APPARATUS FOR REGULATING THE SPEEDS OF DRIVEN UNITS IN MACHINE TOOLS OR THE LIKE

Heinz Hartkopf, Solingen, Germany, assignor to Th. Kieserling & Albrecht Werkzeugmaschinenfabrik, Solingen, Germany

Filed Feb. 9, 1970, Ser. No. 9,785
Claims priority, application Germany, Feb. 11, 1969, P 19 06 651.4
Int. Cl. F04b *23/04*, *41/06*
U.S. Cl. 417—426 10 Claims

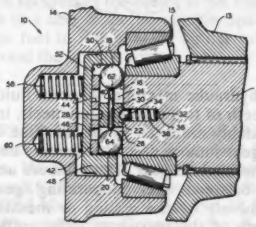


The rate of delivery of two axial piston pumps is adjustable by the cores of two flexible shafts each of which can change the inclination of a pivotable part in the respective pump. The cores carry followers movable in slots provided in the arms of a lever which is pivotable to thereby change the delivery of one or both pumps. The lever can be pivoted by a reciprocable holder having two forks which guide the followers and move them toward or away from the axis of the lever in response to displacement of the holder. This causes adjustment of one of the pumps because one of the followers is normally held against movement in a direction to move the corresponding core axially. The pumps can be adjusted simultaneously if the one follower is moved by a slide to thereby pivot the lever and cause the other follower to move the corresponding core lengthwise to the extent determined by selected distances between the axis of the lever and the followers.

3,619,091
FLUID PRESSURE DEVICE

Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company

Filed Mar. 27, 1970, Ser. No. 23,123
Int. Cl. F04b *19/02*
U.S. Cl. 417—462 13 Claims

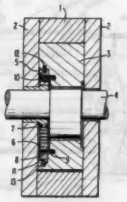


A fluid pressure device of the ball piston type wherein a locating rod is provided to define a minimum distance between opposing ball pistons, insuring that a ball piston will not stick in an inoperative position. A slidable dividing member may be releasably located in a central position between opposing fluid chambers so that the volume of each fluid chamber may remain constant during operation if required to do so by inlet or outlet fluid flow restrictions.

3,619,092
DEVICE FOR ATTACHING A PISTON GEAR IN A ROTARY PISTON ENGINE

Noriyuki Kurio, Hiroshima, Japan, assignor to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Filed June 17, 1970, Ser. No. 46,853
Claims priority, application Japan, June 17, 1969, 44/57531
Int. Cl. F01c *1/02*; F04c *1/02*; F16h *57/00*
U.S. Cl. 418—61 4 Claims

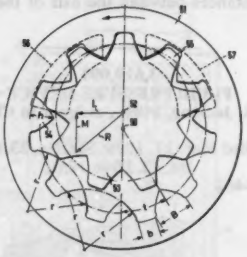


A device for attaching a piston gear in a rotary piston engine which has a rotary piston formed with a circular recess on an end face thereof, a piston gear mounted circumferentially and resiliently by spring pins within said circular recess and also having a step provided on the outer periphery thereof, and a snapring engaged with said step and inserted into a ring groove provided on the inner peripheral face of the recess to prevent the piston gear from moving in axial direction.

3,619,093
GEAR-TYPE HYDRAULIC MACHINE

Hermann Harle, Freiolsheim, and Siegfried Eisenmann, Neckarsulm, both of Germany, assignors to Furstlich Hohenzollernsche Huttenverwattung Laucherthal, Laucherthal, Hohenzollern, Germany

Filed Nov. 13, 1969, Ser. No. 876,370
Claims priority, application Germany, Nov. 18, 1968, P 18 09 445.6
Int. Cl. F01c 1/10, 19/08, 21/00
U.S. Cl. 418—73 22 Claims

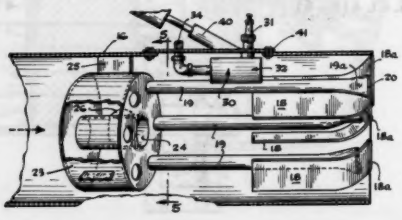


A gear-type hydraulic machine, wherein fluid is conveyed between gear teeth of two mating gearwheels, includes an internal gear rotatably mounted in the machine and a smaller inner external gear mounted in the machine on journals and meshing with the internal gear. The pressure and the suction sides formed between the cooperating gear teeth are separated exclusively by the mating or meshing teeth. The numbers of teeth of the two gears differ sufficiently that a substantial part of the gear peripheries run out of engagement to define a crescent-shaped zone between the gears. This crescent-shaped zone communicates, through suitably dimensioned leakage passages or gaps, with the respective pressure and suction sides of the machine in order for intermediate pressure to build up in the crescent-shaped zone. This intermediate pressure operates to reduce substantially the radial thrust applied to the smaller inner gear by the pressure on the pressure side.

3,619,094
BURNER AND METHOD FOR ODOR ELIMINATION

La Clede Lientz, Hollister, Mo., assignor to Chemetron Corporation, Chicago, Ill.

Filed May 21, 1969, Ser. No. 835,284
Int. Cl. F23j 15/00
U.S. Cl. 431—5 4 Claims

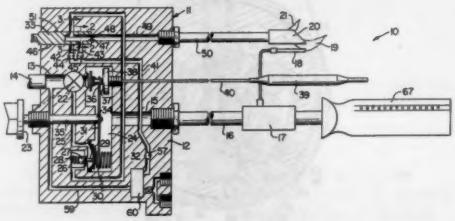


A burner and method which can substantially eliminate odorous materials or smoke from an airstream at a high volume. Air containing odorous materials is directed at a high rate and volume around a multiplicity of tubular members having flared or elongated passageways. The odorous air is directed around the ends of the passages by vanes and the fuel in the tubular members is combined therewith between the ends of the passages and the vanes to incinerate the odorous substances in the air a short distance from the vanes.

3,619,095
FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 18, 1970, Ser. No. 47,356
Int. Cl. F23q 9/08
U.S. Cl. 431—42 10 Claims

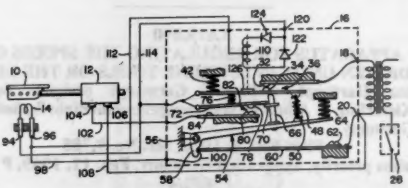


Control means having a first passage means for interconnecting a source of fuel to a pilot burner means to produce a small standby flame at the pilot burner means, the control means having second passage means for additionally interconnecting the source of fuel to the pilot burner means to produce a large heater flame at the pilot burner means whereby no fuel is adapted to be interconnected to a main burner means when only a small standby flame exists at the pilot burner means and the source of fuel is adapted to be interconnected to the main burner means when the large heater flame exists at the pilot burner means. A single adjusting means is provided in the passage means for adjusting the fuel flow rate therethrough by substantially infinitely adjusting the flow rate through one of the passages and adjusting the flow rate through the other passage means in substantially a stepped manner.

3,619,096
IGNITION PROVING SYSTEMS

Keith T. Krueger, Garden Grove, and Hugh J. Tyler, Santa Ana, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 10, 1969, Ser. No. 856,749
Int. Cl. F23n 5/02
U.S. Cl. 431—66 28 Claims



Ignition-proving systems utilizing a holding coil in parallel with an electric igniter, a heat expansible wire in series with the igniter, and first and second switches controlled by the coil and wire, respectively, to control the operation of a fuel valve whereby the system assumes a fail-safe state in response to any failures of components or electricity.

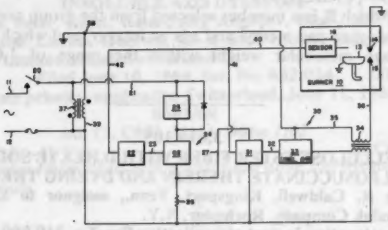
3,619,097
SAFETY TIMED BURNER CONTROL SYSTEM

Homer B. Clay, Minneapolis, Minn., and William Lloyd Hewitt, Harbor City, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 27, 1970, Ser. No. 14,956
Int. Cl. F23n 5/10
U.S. Cl. 431—80 9 Claims

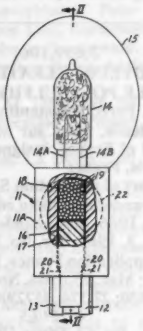
A burner control system adapted to be connected to a fuel burner wherein a safety timing circuit is used to assure igni-

tion of the burner fuel and subsequent proper operation of the burner. The safety timer circuit utilizes a capacitive voltage divider network that initially is supplied with energy at start up of the system, and which is subsequently supplied



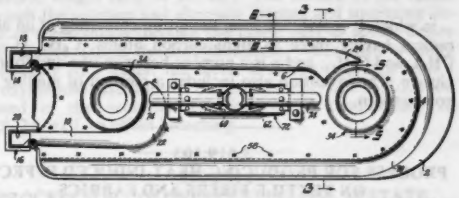
with energy from a flame rectification sensor in order to assure the ignition and continued operation through an ignition control means and a silicon-controlled spark-generating circuit. The sensing of flame also causes the shutdown of the silicon controlled spark ignition portion of the system.

3,619,098
PHOTOFLASH UNIT
Theodore F. Bolles, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 3, 1969, Ser. No. 873,198
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **5 Claims**



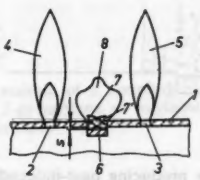
A disposable photoflash unit containing a reserve cell as a source of energy for ignition. The aqueous electrolyte of the reserve cell is contained in a multiplicity of small capsules and the cell is activated by rupturing a substantial portion of the capsules thereby releasing the electrolyte.

3,619,099
TOP BURNER STRUCTURE FOR GAS RANGES
Harold J. Moss, Charleston; Gene S. Sliger, Cleveland, and Jimmie L. Taylor, Cleveland, all of Tenn., assignors to Magic Chef, Inc., Cleveland, Tenn.
Filed Apr. 9, 1970, Ser. No. 27,025
Int. Cl. F24c *3/10*
U.S. Cl. 431—192 **7 Claims**



A pair of metal plates having face-to-face channels are secured together and sealed at their edges by ceramic enamel. The plates define manifold chambers communicating with the channels and an annular burner, having burner holes near its top, is secured to the plates at the manifold chamber. A depression in a side of the burner has openings for directing jets of gas fuel to mix near an igniter tube and to move upwardly toward the burner holes.

3,619,100
BURNER TIP FOR MULTIGAS BURNER
Helmut Schmidt Auf Altenstadt, Remscheid-Reinshagen, and Georg Hein, Huckeswagen, both of Germany, assignors to Joh. Vaillant KG, Remscheid, Berghauser Strasse, Germany
Filed Mar. 12, 1970, Ser. No. 18,995
Claims priority, application Germany, Apr. 5, 1969, P 19 17 509.8
Int. Cl. A01n *9/20;* **A61k** *27/00*
U.S. Cl. 431—349 **8 Claims**



The top of an enclosure defining a mixing chamber is formed of sheet metal having apertures therein through which the gas-air mixture freely flows to form the main flames. Adjacent the apertures, the sheet metal is slit and displaced inwardly in the form of a web defining parallel slots along its sides from which the mixture flows to form adhering flames.

CHEMICAL

3,619,101
COLORING LIVE HUMAN HAIR WITH WATER-SOLUBLE COLORED POLYMERS
Gregoire Kalopissis, Paris, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France
Continuation-in-part of application Ser. No. 227,542, Oct. 1, 1962, now abandoned. This application Jan. 28, 1966, Ser. No. 523,525
Claims priority, application France, Luxembourg, Luxembourg, Oct. 5, 1961, Sept. 6, 1965, May 13, 1965, 875,144; 49,441/65; 48,591/65
Int. Cl. A11k *7/12*
U.S. Cl. 8—10.1 **27 Claims**

The method of coloring human hair with compositions which contain a dissolved water-soluble film forming polymer that has chemically bonded dye groups. Hair dye compositions containing specific dissolved polymers that have lateral side chains chemically bonded to the polymer chain and a terminal dye group.

3,619,102
DYEING KERATINIC FIBERS WITH AQUEOUS SOLUTIONS OF DIRECT DYES AND ORGANIC SOLVENTS
Charles Zviak, Franconville, and Giuliana Ghilardi, Paris, both of France, assignors to L'Oreal, Paris, France
Filed June 7, 1968, Ser. No. 743,578
Claims priority, application Luxembourg, June 9, 1967, 53850/67
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.1 **4 Claims**

A composition for dyeing keratinic fibers and particularly human hair which comprises, in aqueous solution, at least

one direct dye having a poor affinity for the fiber at room temperature and an organic solvent which is inert to both the dye and the fiber, and corresponds to the formula

$$R-(O-CH_2-\underset{\displaystyle CH_2OH}{\underset{|}{CH}})_n-OH$$

in which R is selected from the group consisting of an alkyl radical having three to eight carbon atoms, C_6H_5, (C_6H_5–CH_2), and C_6H_{11}, and n is a number between one and four inclusive. The invention also includes a method of making the composition.

3,619,103

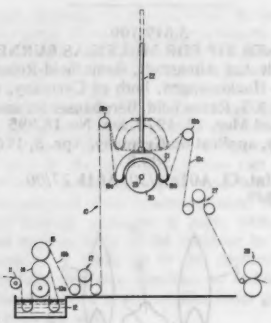
PROCESS FOR PRODUCING HEAT-INDUCED EFFECTS ON TEXTILE FIBERS AND FABRICS

Sumner Henry Williams, Short Hills, N.J., and Joseph Reid Ellis, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 660,167, Aug. 3, 1967, now Patent No. 3,498,086, Continuation-in-part of application Ser. No. 614,520, Feb. 7, 1967, now abandoned. This application Mar. 25, 1969, Ser. No. 810,323

Int. Cl. D06p *5/00*

U.S. Cl. 8—14 **5 Claims**



A process for producing heat-induced effects on textiles, films or other suitable flexible substrata such as for example:

1. physical migration of dyes, chemicals or pigments;
2. heat fixation of dyes, chemicals or pigments;
3. development of dyes, chemicals or pigments by the reaction of two or more components, or by heat-induced transformation of an intermediate;
4. curing of creaseproofing agents, cross-linking agents, synthetic resins, natural gums, etc.;
5. discharging or destroying of dyes, pigments, etc.;
6. drying of said flexible substrata.

Localized and overall chemical reactions and physical changes on or in such substrata are obtained by application of heat, i.e. a temperature from about 500° F. to about 1,500° F., by contact of the flexible substrata with a heated surface within a short period of contact, e.g. a fraction of a minute, generally.

3,619,104

PROCESS FOR THE PRODUCTION OF LEVEL END-UNIFORM DYEINGS WITH WATER-SOLUBLE SULPHURIC ACID ESTERS OF LEUCO-VAT DYESTUFFS

Joseph Van Diest, Binningen, and Louis Frossard, Basel, both of Switzerland, assignors to Sandoz AG, Basel, Switzerland

Filed June 27, 1969, Ser. No. 837,332

Claims priority, application Switzerland, June 28, 1968, 9669/68

Int. Cl. D06p *3/82*

U.S. Cl. 8—21 **4 Claims**

A process for the production of consistently level and end-uniform dyeings on textile materials selected from the group consisting of cotton and of mixtures of cotton and polyesters by padding with sulfuric acid esters of leuco-vat dyestuffs, wherein the padding is carried out in the presence of a polyglycol of the formula

$$HO-(CHRCH_2O)_x-H$$

in which R is a member selected from the group consisting of hydrogen and methyl and x is an integer, and which has an average molecular weight within the range of 1,000 to 20,000.

3,619,105

CELLULOSE ESTER FIBER WITH D,HEXYL SODIUM SULFOSUCCINATE THEREIN AND DYEING THEREOF

John R. Caldwell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 319,990, Nov. 30, 1963, now Patent No. 3,432,472, dated Nov. 9, 1971. This application Sept. 22, 1967, Ser. No. 669,726. The portion of the term of the patent subsequent to Mar. 11, 1986, has been disclaimed and dedicated to the public.

Int. Cl. D06p *1/36*

U.S. Cl. 8—31 **8 Claims**

Cellulose ester compositions having dispersed therein a salt having the structure R-X-M where R is an organic radical; X is an acid radical containing phosphorus or sulfur and having a dissociation constant of about 1X10–3 or higher; and M is an ion derived from a metal or amine. The cellulose ester compositions so modified are easily dyed with cationic dyes to obtain bright, vivid color which has excellent fastness toward light, laundering and drycleaning. Also disclosed is a process for preparing a fiber dyed with cationic dyes.

3,619,106

PROCESS FOR DYEING KERATINIC FIBERS WITH WATER-SOLUBLE POLYSULFHYDRYL POLYMERS

Gregoire Kalopissis, Paris; Constantin Aretos, Issy-Les Moulineaux; Roger Charle, Soisy sur Montmorency, and Jean Gascon, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of application Ser. No. 441,311, Mar. 19, 1965, now abandoned , and a continuation-in-part of 565,371, July 15, 1966, now abandoned. This application Nov. 3, 1969, Ser. No. 873,627

Claims priority, application France, Luxembourg, June 19, 1964, Aug. 5, 1965; Mar. 23, 1964, Nov. 6, 1964, Jan. 7, 1965, Mar. 8, 1965, 978,830; 27,374; 45729/64; 47298/64; 47746/65; 45729/65

Int. Cl. D06p *1/00*

U.S. Cl. 8—31 **11 Claims**

The process of dyeing keratinic fibers comprising first treating the fibers with an aqueous solution of water-soluble keratinic fiber reactive polysulfyhdryl polymer which has —SH groups that react with the keratinic fiber, said polymer being present in amounts of about 0.1–10 percent by weight of the aqueous solution then dyeing the keratinic fibers with a dye composition selected from the group consisting of reactive dyes and metallized monoazo acid dyes.

3,619,107

PROCESS FOR DYEING, PADDING AND PRINTING OF SYNTHETIC FIBERS WITH MONOAZO DYESTUFFS OF A DIAZOTIZED AMINOBENZENE AND AMINOPHENYLMETHYLPYRAZOLONE

Hans Schladetsch, Frankfurt/Main; Erich Brenneisen, Hofheim/Taunus; Helmut Lindner, Frankfurt/Main, and Heinz Schmidt, Kelkheim/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Apr. 2, 1969, Ser. No. 812,885

Claims priority, application Germany, Apr. 20, 1968, P 17 69 214.7

Int. Cl. D06p *1/02;* **C09b** *29/38*

U.S. Cl. 8—41 **3 Claims**

Process for the dyeing, padding and printing of fibrous materials consisting of or containing cellulose acetate, linear polyamide, polyurethane and polyester fibers by treating the said materials with water-insoluble monoazo dyestuffs ob-

tained from the reaction of a diazotized aminobenzene with a 1-(3'- or 4'-amino-phenyl)-3-methyl-pyrazolone-(5).

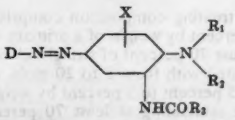
3,619,108

POLYESTER FIBERS DYED WITH A WATER-INSOLUBLE AZO DYESTUFF

Richard Peter, Basel; Hans-Joerg Angliker, Basel, and Hans Wilhelm Liechti, Oberwil, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed June 10, 1969, Ser. No. 832,024
Claims priority, application Switzerland, June 11, 1968, 8661/68
Int. Cl. C09b 31/14; D06p 1/02
U.S. Cl. 8—41 C 12 Claims

Polyester fibers dyed with a water-insoluble azo dyestuff of the formula



in which D represents the residue of a diazo component, R_1 and R_2 each represents an alkyl group that may be substituted and that may be interrupted by an oxygen atom, R_3 represents a six-membered heterocyclic residue and X represents a hydrogen atom or an alkyl, aryl, aryloxy, arylthio or alkyoxy group.

3,619,109

COBALT-PHTHALOCYANINE-POLYAMINE COMPLEXES FOR THE DYEING AND PRINTING OF TEXTILES

Heinrich Vollman, Leverkusen; Peter Mertens, Cologne-Marienburg; Johannes Eibl, Burscheid-Kaltenherberg, and Ulrich Altmann, Cologne-Duennwald, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 22, 1968, Ser. No. 754,709
Claims priority, application Germany, Aug. 31, 1967, F 53376
Int. Cl. D06p 3/60
U.S. Cl. 8—54.2 10 Claims

A process for dyeing and printing textile materials made of natural or regenerated cellulose wherein an insoluble cobalt-phthalocyanine is solubilized by oxidizing to a hexavalent state and complexing with two molecules of an amine which complex contains an anion, is dissolved in a solvent and is applied to the textile materials which materials are subsequently treated to a heating treatment above 100° C. or to a treatment with reducing agents to convert the salts of cobalt-phthalocyanine to the original insoluble state.

3,619,110

PROCESS OF HYDROPHILIZATION, PURIFICATION AND BLEACHING OF CELLULOSE FIBERS

Roger Julien Borezee, La Celle Saint-Clous, France, assignor to Ugine Kahlmann, Paris, France

Filed Oct. 22, 1969, Ser. No. 868,639
Claims priority, application France, Oct. 22, 1968, 170,805
Int. Cl. D06l 3/06
U.S. Cl. 8—109 7 Claims

Cellulosic materials, such as cotton fibers or mixtures of cotton and other cellulosic or synthetic fibers, are hydrophilized, purified and bleached by treating the cellulosic materials with a small amount of chlorine dioxide over a short period of time and then bleaching the treated cellulosic material with a peroxidized compound.

3,619,111

DESIZING, SCOURING AND BLEACHING COTTON/POLYESTER FABRICS CONTAINING PORTIONS DYED WITH SENSITIVE DYESTUFFS

Marvin H. Rowe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1970, Ser. No. 12,124
Int. Cl. D06l 3/02
U.S. Cl. 8—111 4 Claims

A method of desizing, scouring and bleaching greige cotton/polyester fabrics containing colored portions constructed of yarns dyed with an excess of sensitive dyestuffs without incurring color markoff upon, or bleeding into the white background portions of the fabric. The dry greige fabric is first singed then quenched with steam or a water mist under conditions preventing a water pickup exceeding 30 percent of the fabric weight. The fabric is then passed through a multidip-type rope washer used as a treating chamber in which the solution contained therein is a hot alkaline solution of surface active agent held at 160°–210° F. and is at a solution to fabric weight ratio of 20–40:1. The motion of the fabric through the solution and alternate dipping and squeezing action of the solution through the fabric acts to scour, desize and remove excess dyestuff therefrom. After then washing thoroughly with water, the fabric is finally saturated with a peroxymonosulfate solution buffered at a pH of 5 to 8.5, then heated in the saturated condition at a temperature of 100°–212°F. to effect bleaching.

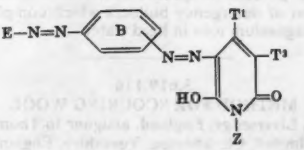
3,619,112

PROCESS FOR COLORING CELLULOSE ACETATE, POLYAMIDE AND POLYESTER TEXTILE MATERIALS WITH WATER-INSOLUBLE DISAZO DYESTUFFS

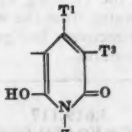
Alistair Howard Berrie, and Nigel Hughes, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 1, 1969, Ser. No. 881,310
Claims priority, application Great Britain, Dec. 9, 1968, 58279/68
Int. Cl. C09b 31/14; D06p 1/18
U.S. Cl. 8—41 R 3 Claims

Process for coloring cellulose acetate, polyamide and polyester textile materials with water-insoluble disazo dyestuffs of the formula:



wherein E is a residue of a coupling component of the phenol, naphthol, 5-pyrazolone or acylacetarylamide series or a group of the formula:



T^1 and T_2 each independently represent a hydrogen atom, an optionally substituted hydrocarbon radical or a cyano, acyl, carboxylic acid ester or amide group, Z is a hydrogen atom or an optionally substituted hydrocarbon radical, and the benzene ring B can contain substituents.

3,619,113

FLAME-RETARDANT FINISH FOR CELLULOSIC TEXTILE MATERIALS

Richard Frederick Stockel, Bridgewater Township, Somerset County; Samuel James O'Brien, Dunellen, and Robert George Weyker, North Plainfield, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 26, 1969, Ser. No. 861,481
Int. Cl. D06m 13/14, 13/28; C09k 3/28
U.S. Cl. 8—116.3 9 Claims

A flame-retardant finish for cellulosic textile materials, the method of applying it and the textile materials treated with the flame retardant. More particularly, the flame-retardant finish comprises an aqueous solution of tris(hydrox-

ymethyl)phosphine (THP) or tris(alkoxymethyl)phosphine (formula I), a methylolated nitrogenous cellulose reactant and, optionally, urea.

$P(CH_2OR)_3$

3,619,114
TREATMENT OF KERATINOUS SUBSTRATES
Giuseppe Anzuino, Vercelli, Italy, and Clarence Ralph Robbins, Piscataway, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 14, 1970, Ser. No. 2,944
Int. Cl. D06m *3/00, 3/02, 13/00*
U.S. Cl. 8—127.5 11 Claims

A process for the modification of monomer pretreated keratinous substrates which comprises treating said substrate with a small but effective amount of a copper ammonium hydroxide solution.

3,619,115
COOL WATER LAUNDERING PROCESS
Francis L. Diehl, Wyoming, Ohio, and Norman R. Smith, Heidelberg-Rohrbach, Germany, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 581,720, Sept. 26, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 413,948, Nov. 25, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 163,041, Dec. 29, 1961, now abandoned. This application Sept. 8, 1967, Ser. No. 666,498
Int. Cl. D06f
U.S. Cl. 8—137 5 Claims

A process for laundering fabrics in 60° F.–90° F. Water containing .05–.5 percent of a detergent composition containing 4–35 percent of specific zwitterionic detergents and 8–90 percent of detergency builders which complex the calcium and magnesium ions in hard water.

3,619,116
METHOD FOR SCOURING WOOL
Neil Saville, Liversedge, England, assignor to Thomas Burnley & Sons Limited, Cleckheaton, Yorkshire, England
Filed Apr. 2, 1969, Ser. No. 812,813
Int. Cl. D01c *3/00*
U.S. Cl. 8—139.1 3 Claims

A process and plant for scouring wool, wherein the wool is treated with a dry cleaning agent, such as for instance trichloroethylene or perchlorethylene, and used cleaning agent is separated from the wool and washed with a mixture of water and alcohol, the cleaning agent containing wool, grease being then separated from the water and alcohol and recovered in a solvent recovery low pressure and low temperature distillation apparatus.

3,619,117
TREATMENT OF KERATINOUS SUBSTRATES
Giuseppe Anzuino, Vercelli, Italy, and Clarence Ralph Robbins, Piscataway, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 14, 1970, Ser. No. 2,942
Int. Cl. D06m *3/00, 3/02, 13/00*
U.S. Cl. 8—127.5 11 Claims

A process for the modification of monomer-pretreated keratinous substrates which comprises treating the keratinous substrate with a small but effective amount of a compound selected from the group consisting of phenyl, mono- and diisocyanates and phenyl, mono- and di-thioisocyanates.

3,619,118
TREATMENT OF KERATINOUS SUBSTRATES
Giuseppe Anzuino, Vercelli, Italy, and Clarence Ralph Robbins, Piscataway, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 14, 1970, Ser. No. 2,943
Int. Cl. D06m *3/00, 3/02, 13/00*
U.S. Cl. 8—127.5 12 Claims

A process for the modification of monomerpretreated-keratinous substrates which comprises treating the keratinous substrate with a small but effective amount of a compound comprising a mercury salt of an organic carboxylic acid.

3,619,119
PASTY SPOT-TREATING COMPOSITIONS FOR USE ON TEXTILES
Gunter Felletschin, Metzkausen; Josef Hartenstein, Hilden, Rhineland; Horst-Jurgen Krause, Duesseldorf-Holthausen, and Gunter Reese, Duesseldorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Duesseldorf-Holthausen, Germany
Filed Dec. 11, 1968, Ser. No. 783,097
Claims priority, application Germany, Dec. 28, 1967, P 16 17 139.4
Int. Cl. B08b *3/00*
U.S. Cl. 8—137 7 Claims

A pasty spot-treating composition comprising (a) from 2 percent to 10 percent by weight of a primary alcohol mixture containing at least 70 percent of straight-chain C_{16} to C_{18} alcohols, ethoxylated with from 8 to 20 mols. of ethylene oxide, (b) from 0.5 percent to 5 percent by weight of a primary alcohol mixture containing at least 70 percent of straight-chain, saturated C_{12} to C_{14} fatty alcohols, ethoxylated with from 1 to 5 mols. of ethylene oxide, (c) from 15 to 30 percent by weight of an alcohol mixture of alcohols having 10 to 18 carbon atoms, containing at least 50 percent by weight of straight-chain alkanols, ethoxylated with from 1 to 4 mols. of ethylene oxide and sulfated, in the form of a salt selected from the group consisting of alkali metal and ammonium salts, (d) from 0.3 percent to 5 percent by weight of a hydrotropic compound selected from the group consisting of alkali metal and ammonium benzenesulfonates, alkali metal and ammonium toluenesulfonates and alkali metal and ammonium xylenesulfonates, and (e) at least 50 percent by weight of an aqueous solution media. The spot-treating compositions have a practically constant viscosity, are easily rubbed on textiles and have foam-suppressing properties.

3,619,120
DRYCLEANING PURIFIER
John R. Conlisk, and Clement A. Filliben, both of C/O Atlas Chemical Industries Inc., Wilmington, Del.
Filed Nov. 27, 1968, Ser. No. 779,647
Int. Cl. D06l *1/04*
U.S. Cl. 8—142 6 Claims

A purifier composition for drycleaning solvent is provided containing a major fraction of particles of activated carbon of intermediate size and a density equal to or greater than that of the drycleaning solvent in which used and a minor fraction of particulate material of substantially greater particle size, at least a part of which have a density less than that of drycleaning solvent used. Optionally, the minor fraction may also contain particles having a density greater than that of the drycleaning solvent used. The composition is adapted for use in the solvent systems of conventional drycleaning apparatus.

3,619,121
POLYACRYLONITRILE DYEING WITH N-ALKYLAMINOALKYLSULFONIC ACIDS AND BASIC DYES
Gunther Boehmke, Leverkusen,Grobendriesch, and Walter Hees, Koeln, Hoechenberg, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 9, 1969, Ser. No. 865,161
Claims priority, application Germany, Aug. 7, 1969, P 19 40 179.7
Int. Cl. D06p *5/04*
U.S. Cl. 8—169 3 Claims

Polyacrylonitrile fibers are dyed with a basic dye in a solution of a long chain alkylaminoalkanesulfonate or long chain alkyl-, hydroxyalkyl-aminoalkanesulfonate and a nonionc emulsifier. N-Octadecenyl-, N, N - dihydroxyethylaminoethane sulfonate or N-Octyldecyl-, N-benyl-, N-Hydroxylethyl ethanesulfonate are used with a basic azo, oxazine or anthraquionone dye.

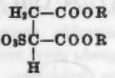
3,619,122

PROCESS FOR DYEING POLYAMIDE FIBERS

Anthony De Maria, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 787,204
Int. Cl. D06p 5/04
U.S. Cl. 8—173 6 Claims

A process for producing barre free dyeing of polyamide fibers comprising dyeing said fibers with a composition comprising an acid dye and a dialkyl sulfosuccinate having the following formula:



wherein R is an alkyl radical having from four to 18 carbon atoms and M is either an alkali metal, alkaline earth metal, ammonium, or a substituted ammonium radical.

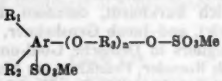
3,619,123

PROCESS FOR DYEING FIBER MATERIALS OF SYNTHETIC POLYAMIDES WITH ACID DYESTUFFS

Klaus Walz, Leverkusen-Wiesdorf; Walter Hees, Cologne-Hoehenberg, and Mathieu Quaedvlieg, Opladen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 29, 1968, Ser. No. 748,233
Claims priority, application Germany, Aug. 7, 1967, F 53164
Int. Cl. D06p 3/24
U.S. Cl. 8—173 8 Claims

Process for dyeing synthetic polyamide fiber materials with acid dyestuff containing dye bath, the improvement comprising including in said dye bath, 0.5 to 2 percent by weight of the polyamide to be dyed, an aromatic sulfonic acid of the following formula:



wherein Ar is an aromatic radical; R_1 and R_2 are H, cycloalkyl, aralkyl aryl or optionally substituted alkyl and together contain at least six carbon atoms; R_3 is alkylene or aralkylene; n is 0 or 1; and Me is a cation.

3,619,124

PROCESS FOR THE DYEING OR PRINTING OF FIBROUS MATERIALS

Gerhard Weckler, Sulzbach, Taunus; Helmut Diery, Kelkheim, Taunus; Lorenz Heib, Hofheim, Taunus, and Franz Schon, Frankfurt am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Oct. 30, 1969, Ser. No. 872,744
Claims priority, application Switzerland, Nov. 4, 1968, 16405/68
Int. Cl. D06p 5/04
U.S. Cl. 8—173 5 Claims

The dyeing or printing of fibrous materials is improved by using a compound of the formula

$R_1—CHX—(CH_2—CH_2—O)_n—R_2$

in which R_1 is alkyl of four to 20 carbon atoms, X is chlorine or bromine, n is a number of three to about 200 and R_2 is an aliphatic hydrocarbon radical of up to 20 carbon atoms, alkylphenyl with up to 12 carbon atoms in the alkyl moiety, phenyl, naphthyl, benzyl, the acyl residue of a fatty acid of up to 18 carbon atoms, benzoyl or the group of the formula $R_1—CHX—CH_2—CH_2$, as dispersing, levelling or after treating agent. The improvement consists in the combination of dispersing and levelling properties.

3,619,125

METHOD OF INHIBITING ACIDIC CORROSION WITH CYCLOHEXYLTHIOUREAS

Robert Alan Porwancher, Wilmette, and Karl Maurice Beck, Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 1, 1968, Ser. No. 764,319
Int. Cl. C23f 11/16
U.S. Cl. 21—2.7 1 Claim

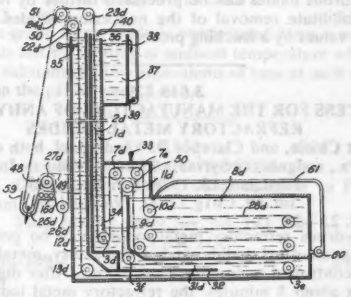
Inhibiting corrosion of metals in contact with aqueous solutions having a pH<7 is accomplished by the addition of from 0.2 to 0.0002 percent of 1,3-dicyclohexyl-2-thiourea or cyclohexyl-2-thiourea to the potentially corrosive solution.

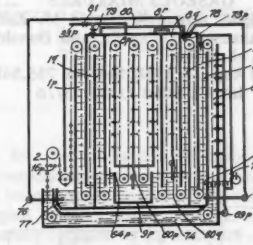
3,619,126

METHOD OF CONTINUOUSLY HEAT-TREATING PRODUCTS IN SEALED CONTAINERS, AND APPARATUS FOR PERFORMING THE SAME

Pierre Carvallo, 24 Villa Dupont, Paris, 16eme, Seine, France

Filed Sept. 22, 1964, Ser. No. 398,240
Claims priority, application France, Oct. 1, 1963, 949,146
Int. Cl. A61l 1/00, 3/00; A23l 3/04
U.S. Cl. 21—56 11 Claims





Method and apparatus for thermal treatment of products contained in sealed containers, in which the containers are conveyed along a path of travel comprising in succession at least one inlet hydrostatic pressure column, at least one treatment chamber under pressure and at least one outlet hydrostatic pressure column, the containers traveling in said chamber in contact with a liquid contained in said chamber and maintained to a predetermined treatment temperature, the liquid and its vapor in said chamber being subjected to an overpressure with a gaseous fluid, the pressure of which is constantly maintained at a value greater than the vapor pressure of said liquid at said treatment temperature, said overpressure being balanced by said hydrostatic columns.

3,619,127
METHOD OF PURIFYING AUTOMOTIVE EXHAUST GASES

Robert H. Hass, Fullerton, and Rowland C. Hansford, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 22, 1966, Ser. No. 581,175
Int. Cl. B01d 53/34; B01j 11/08
U.S. Cl. 23—2 E 4 Claims

Dilute combustible gases such as automobile exhaust gases, are oxidized by contacting the same at elevated temperatures with a catalyst comprising a minor proportion of a group VIII noble metal and a minor proportion of a group VIB metal, supported on a carrier such as alumina.

3,619,128
METHOD FOR PROCESSING RARE EARTH FLUOROCARBONATE ORES

Richard L. Angstadt, Armonk, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Dec. 5, 1968, Ser. No. 781,607
Int. Cl. C22b 59/00
U.S. Cl. 23—18 1 Claim

Rare earth fluorocarbonate ore is processed by digesting the ore in concentrated aqueous alkaline solution at a temperature of between about 100° C. and about 150° C. followed by separating the rare earth mineral values from the digestion solution in the form of rare earth hydrous oxides. The hydrous oxides can be processed further by roasting so as to facilitate removal of the noncerium oxides from the cerium values by a leaching process.

3,619,129
PROCESS FOR THE MANUFACTURE OF ANHYDROUS REFRACTORY METAL IODIDES

Vincent Chiola, and Clarence D. Vanderpool, both of Towanda, Pa., assignors to Sylvania Electric Products, Inc.

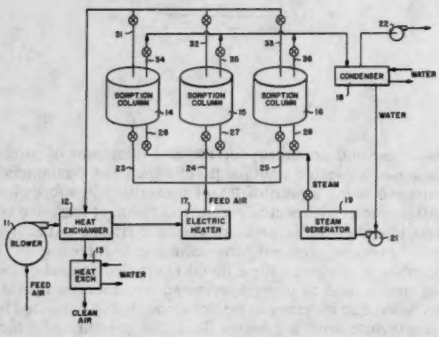
Filed Jan. 13, 1970, Ser. No. 2,645
Int. Cl. C01g 35/00, 39/00, 41/00
U.S. Cl. 23—22 8 Claims

Anhydrous refractory metal iodides can be prepared by reacting an alkyl iodide and a refractory metal chloride under controlled temperature conditions. After digesting for at least about 5 minutes, the refractory metal iodide is isolated and dried under a nonoxidizing atmosphere.

3,619,130
METHOD OF REMOVING CARBON DIOXIDE FROM GASEOUS MIXTURES

Frank J. Ventriglio, Annapolis; David M. Zall, Annapolis; Cyril J. Stockhausen, Annapolis, and Donald R. Decker, Jr., Baltimore, all of Md.

Filed Aug. 27, 1968, Ser. No. 755,548
Int. Cl. B01d 53/00, 53/16
U.S. Cl. 23—25 6 Claims

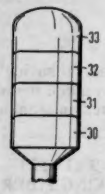


Method for removing CO_2 from air by passing said air through said sorbent material made by treating molecular sieve-type zeolite with aqueous solution of any alkali carbonate. The sorbent material may be regenerated repeatedly by passing either heated air or superheated steam therethrough.

3,619,131
METHOD OF PRODUCING STOICHIOMETRIC MG-AL SPINEL CRYSTALS FOR INTEGRATED CIRCUITS

Josef Grabmaier, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed May 6, 1969, Ser. No. 824,734
Claims priority, application Germany, May 6, 1968, P 17 67 394.8
Int. Cl. B01j 17/24; C01f 7/02; H01h 3/10
U.S. Cl. 23—52 7 Claims

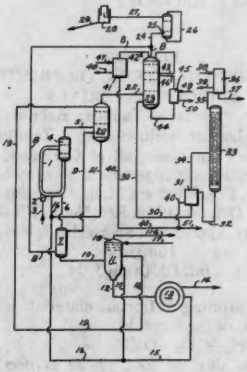


A method of producing Mg-Al spinel crystals of a stoichiometric composition free from precipitation and tension. The invention is characterized in that the carrier crystal is an alumina-rich spinel crystal. The crystal growing thereon is produced according to its length by changing the provided mixing ratio of MgO/Al_2O_3 to a stoichiometric composition of the desired spinel crystal. During the growth process, slight amounts of TiO_2 are added to the spinel powder supplied.

3,619,132
PROCESS FOR THE PRODUCTION OF ALKALI CYANIDES

Hans-Joachim Mann, Brilon; Klaus Simon, Rheinfelden; Robert Richter, Hochkirchen; Friedrich Bittner, Bad Soden; Heinrich Burkhardt, deceased, Bruhl (by Sigrid Burkhardt, heir), and Jacob Gensheimer, Frankfurt, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 28, 1968, Ser. No. 771,188
Claims priority, application Germany, Oct. 27, 1967, P 15 92 329.2
Int. Cl. C01c 3/08; B01d 9/00
U.S. Cl. 23—79 9 Claims



Alkali cyanides are prepared from carbon dioxide free impure hydrocyanic acid gases by reacting with aqueous alkali hydroxide, e.g. NaOH or KOH, in a first step at subatmospheric pressure to form the alkali cyanide and then the alkali cyanide is crystallized in a second step at a still lower pressure.

3,619,133

METHOD FOR PREPARING SODIUM AMMONIUM HYDROGEN PHOSPHATE

Kozo Fukuba, Niihama; Reiji Matsuda, Niihama; Syozo Fujioka, Shuso-Gun, Ehime-ken; Yasutomo Ogushi, Niihama, and Shigeru Nishibara, Niihama, all of Japan, assignors to Sumitomo Chemical Co., Ltd.

Filed Nov. 27, 1968, Ser. No. 779,373
Claims priority, application Japan, Dec. 6, 1967, 42/78572
Int. Cl. C01b *25/26, 25/28*
U.S. Cl. 23—107 2 Claims

This invention relates to a process for producing sodium ammonium hydrogenphosphate ($NaNH_4HPO_4.4H_2O$) of a high purity and ammonium chloride or an ammonium chloride-containing solution from phosphoric acid, ammonia and sodium chloride or ammonium phosphate and sodium chloride.

3,619,134

METHOD OF PRODUCING SMALL PARTICLE SIZE Z-14 ZEOLITE

Charles S. Park, deceased, late of Baltimore (by Gwen J. Burke, administratrix), and Philip K. Maher, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of application Ser. No. 633,355, Apr. 21, 1967, now abandoned. This application Mar. 16, 1970, Ser. No. 18,793
Int. Cl. C01b *33/28*
U.S. Cl. 23—113 4 Claims

Method of producing crystalline Z-14 zeolite having a particle size in the range of 20 to 200 millimicrons, wherein a reaction mixture having controlled molar ratios of Na_2O, SiO_2, Al_2O_3 and H_2O is prepared at a low temperature, preferably within the range of −5° C. to +5° C. digested, and thereafter refluxed for a period of time to crystallize Z-14 zeolite having the desired particle size. The product is particularly suited, either in pure form or dispersed in a matrix, as a catalyst in the treatment of hydrocarbons.

3,619,135

PROCESS FOR GENERATING HYDROCARBON FREE RADICALS FROM CARBOXYLIC ACIDS AS TERTIARY ALCOHOLS

Alexander F. MacLean, Durham, N.H., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 333,751, Dec. 26, 1967, now abandoned. This application Jan. 29, 1969, Ser. No. 795,031
Int. Cl. C01c *3/00*; C07c *121/18, 9/06*
U.S. Cl. 23—151 19 Claims

Certain organic reactants which are free from aliphatic unsaturation and which are capable of yielding free radicals upon treatment with peroxides are oxidized, in the liquid phase in an aqueous medium, with certain peroxy compounds to form free-radical intermediates which are then allowed to react further with themselves or with other components of the reaction medium to form useful end products. Preferred features include the slow addition of the peroxy compound to the reaction zone and the use of certain metalic ions to improve yields. The process may be used for the reaction of HCN and carboxylic acids to produce nitriles; the conversion of tertiary alkanols to ketones; and the production of cyanogen from hydrogen cyanide.

3,619,136

PROCESS FOR PRODUCING PHOSPHORIC ACID

Everett N. Case, Flossmoor, Ill., assignor to Atlantic Richfield Company

Filed Nov. 12, 1968, Ser. No. 774,960
Int. Cl. C01b *25/18, 25/22*
U.S. Cl. 23—165 22 Claims

A process for the production of phosphoric acid from phosphate rock comprising reacting the phosphate rock with an equilibrated phosphoric acid having a P_2O_5 concentration between about 20 to 50 percent in an attack stage at a temperature below about 180° F. to dissolve at least about 90 percent of the phosphate values in the rock and produce a monocalcium phosphate-phosphoric acid-water solution up to about 90 percent saturated with monocalcium phosphate and containing insoluble material and less than about 1 percent fluorine, the weight ratio of P_2O_5 in the acid to P_2O_5 in the rock feed being sufficient to dissolve the phosphate values in the rock and provide the desired solution and at least about 7:1, separating the insoluble material from the solution to produce a solution of monocalcium phosphate-phosphoric acid-water, reacting sulfuric acid with said solution to produce phosphoric acid and precipitate calcium sulfate, the sulfuric acid being added in an amount essentially stoichiometric with respect to the monocalcium phosphate in the solution, separating the calcium sulfate from the phosphoric acid solution, recycling the phosphoric acid solution to the attack stage to provide said equilibrated acid, and removing a portion of the phosphoric acid as product.

3,619,137

PRODUCTION OF IRON OXIDE PIGMENTS

Eric G. Ratcliffe, Easton, Pa., assignor to Pfizer Inc., New YOrk, N.Y.

Filed Jan. 16, 1969, Ser. No. 791,774
Int. Cl. C01g *49/02*; C22b *3/00*
U.S. Cl. 23—200 7 Claims

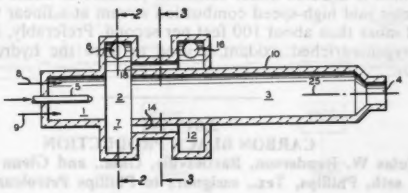
Pigment-grade ferric oxide is precipitated from a solution of a ferrous salt by aerating at ambient temperature while introducing substantially two equivalents of base at such rate as to maintain the pH between 5 and 6.

3,619,138

CARBON-BLACK PROCESS

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 23, 1969, Ser. No. 793,288
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 8 Claims



A process for the production of carbon-black by the pyrolytic decomposition of a hydrocarbon feed with hot combustion gases introduced through the periphery of the reactor and commingled with an augmenting gas introduced in a direction generally opposite to the axial flow of the hydrocarbon feed through the reactor.

3,619,139

MANUFACTURE OF CARBON FILAMENTS

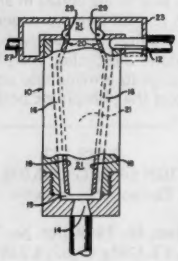
Kenneth G. O. Dixon, Ashtead; Richard Malcolm Gill, Pinner, and Donald R. Lovell, London, all of England, assignors to Morganite Research & Development Limited, London, England

Filed Jan. 31, 1969, Ser. No. 795,718
Claims priority, application Great Britain, Feb. 2, 1968, 5353/68
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.1 4 Claims

The production of carbon filaments by the pyrolysis of filamentary material, such as filaments of cellulose and polymers or copolymers of acrylonitrile, wherein the heating of the filaments above 900° is conducted in the presence of a carbon gettering material in a protective atmosphere. The carbon gettering material is preferably provided by the car-

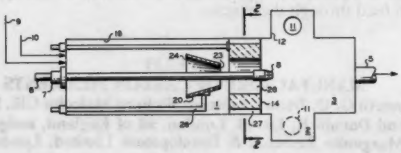
bonization of cellulosic paper in which the filaments are wrapped during the heating above 900° C.

3,619,140
PROCESS FOR MAKING CARBON BLACK
Allan C. Morgan, Winchester, and Merrill E. Jordan, Walpole, both of Mass., assignors to Cabot Corporation, Boston, Mass.
Filed Jan. 3, 1967, Ser. No. 606,665
Int. Cl. C09c 1/50
U.S. Cl. 23—209.4 3 Claims



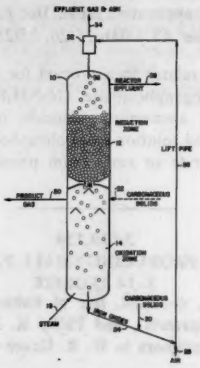
A process is provided for making high-quality carbon blacks at unusually good yields in a highly compact reaction space. The key steps of the process are the generation of a very hot combustion gas stream moving at very high speed in essentially plug flow by burning a hydrocarbon gas in oxygen in a compact combustion zone under conditions of very high heat release assuring the attainment of temperatures of over 3,000° F. and the transverse injection into said high-speed combustion stream from the periphery thereof of a plurality of individual streams of liquid hydrocarbon make, each of which is injected under sufficient pressure to cause same to enter said high-speed combustion stream at a linear velocity of more than about 100 feet per second. Preferably, a highly oxygen-enriched oxidant is used to burn the hydrocarbon gas.

3,619,141
CARBON BLACK PRODUCTION
Eulas W. Henderson, Bartlesville, Okla., and Glenn J. Forseth, Phillips, Tex., assignors to Phillips Petroleum Company
Filed Oct. 21, 1968, Ser. No. 769,281
Int. Cl. C09c 1/50
U.S. Cl. 23—209.4 6 Claims



Process for the production of carbon black by the pyrolytic decomposition of a hydrocarbon feed in a reactor having an axial zone, a combustion zone, and a carbon black formation zone in axial alignment wherein the gases in the axial zone are passed through a cone and/or choke and into the combustion zone and a portion of the gases downstream of the choke passed to the upstream side of the choke.

3,619,142
CONTINUOUS STEAM-IRON PROCESS
James L. Johnson, Oak Park; Frank C. Schora, Palatine, and Paul B. Tarman, Elmhurst, all of Ill., assignors to Consolidation Coal Company, Pittsburgh, Pa.
Filed Feb. 11, 1969, Ser. No. 798,334
Int. Cl. C01b 1/07, 1/02
U.S. Cl. 23—214 8 Claims



In a continuous steam-iron process wherein finely divided iron oxides are reduced in a reduction zone and the reduced iron oxides are reacted with steam in an oxidation zone to make hydrogen, the reduction of the iron oxides is effected by means of a continuously recirculating stream of hot, finely divided carbonaceous solids which are mixed with the iron oxides in a downwardly moving bed under reducing conditions, and heat is supplied to the reduction zone by the carbonaceous solids which are heated by partial combustion outside the reduction zone. In the preferred embodiment of the process, the mixture of reduced iron oxides and carbonaceous solids from the reduction zone is separated in a fluidized separation zone into a stream of reduced iron oxides and a stream of carbonaceous solids. The stream of reduced iron oxides is conducted to the oxidation zone where the reduced iron oxides fall through a fluidized bed of hydrocarbonaceous solids in countercurrent flow relationship to steam, whereby a product gas is produced which contains methane by virtue of the reaction of the hydrogen (produced by the steam-iron reaction) with the hydrocarbonaceous solids.

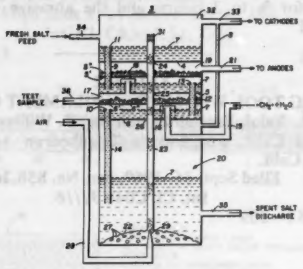
3,619,143
PROCESS FOR THE PURIFICATION OF SULFUR FROM PYRITE AND OTHER SULFUR-CONTAINING ORES
Angel Vian Ortuno; Segundo Jimenez Gomez, and Juan Javier Diaz Roncal, all of Madrid, Spain, assignors to Empresa Auxiliar De La Industria S. A., Madrid, Spain
Filed Apr. 22, 1969, Ser. No. 818,452
Claims priority, application Spain, Apr. 23, 1968, 353037
Int. Cl. C01b 17/06
U.S. Cl. 23—224 17 Claims

Arsenic sulfide is removed from sulfur by treatment with an acidic liquor containing an oxidizing agent, so that sulfuric acid and arsenic acid are formed and sulfur is obtained essentially pure. The process is very economical, because by using nitric acid in sulfuric acid, the nitrogen oxides formed may be oxidized with air, combined with water to regenerate nitric acid and the acidic liquor recycled.

3,619,144
APPARATUS FOR REFORMING HYDROCARBON FUELS TO PRODUCE HYDROGEN
Mohendra S. Bawa, and James K. Truitt, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 590,813, Oct. 31, 1966, Pat. No. 3,505,018.
Filed Sept. 15, 1969, Ser. No. 868,264
Int. Cl. C01b 1/16; H01m 27/20
U.S. Cl. 23—282 5 Claims

Apparatus for reforming hydrocarbon fuels by admixing a hydrocarbon and water to form a feedstream, contacting the

feedstream with an inorganic salt or mixture of inorganic salts in the molten state, and separating the gaseous effluent generated by this contact. After the hydrogen-containing effluent is removed from the molten salt, means are provided



that the latter may be mixed with oxygen at a temperature and pressure sufficient to permit combustion between the oxygen and any residual carbon which may be retained in the salt, after which further means are provided to remove the gaseous reaction products of this combustion.

3,619,145

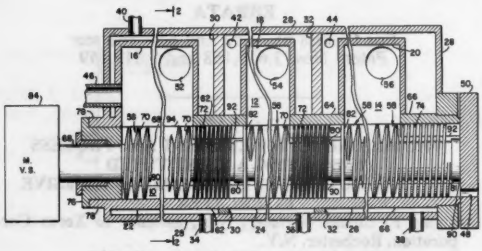
APPARATUS FOR POLYMERIZING LIQUIDS

Jack E. Crawford, Beaumont, Tex.; Ralph W. Edwards, Metuchen; Edward D. Henze, Bridgewater Township, Somerset County, and William C. L. Wu, East Brunswick, N.J., assignors to Mobil Oil Corporation

Division of Ser. No. 630,745, Apr. 13, 1967, Pat. No. 3,522,214. Filed Nov. 28, 1969, Ser. No. 879,950

Int. Cl. C08f *1/98*; B01j *1/00*

U.S. Cl. 23—285 **2 Claims**



Apparatus for treating viscous liquids, as in the polymerization of polyester prepolymer, while the liquid is being transported through one or more reaction chambers in a closed vessel by a pair of closely intermeshed, horizontal, counterrotating screws extending across each chamber. The screws are partially immersed in the liquid and distribute it on their outwardly moving upper surfaces in layers thin enough for the elimination of gaseous products without excessive frothing under subatmospheric pressures in a vapor space extending over a substantial area of the surfaces of the screws. A small nip clearance between the intermeshing screw flights provides a wiping action that prevents accumulating material thereon and exposes fresh surfaces of the polymerizing liquid as well as regulating the thickness of the layer thereof carried upwardly by each screw even when great increases in viscosity occur during polymerization. Gastight seals between adjacent chambers are obtained by completely enclosing the intermeshing screws in close fitting barrels or tunnels and providing restricted orifices therein whereby the enclosed screw sections become completely filled with the polymerizing material.

3,619,146

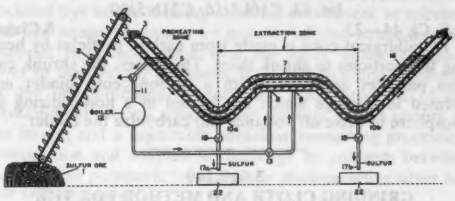
SULFUR RECOVERY

Ruel Carlton Terry, Houston, Tex., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 817,130

Int. Cl. C01b *17/08*

U.S. Cl. 23—308 S **4 Claims**



Sulfur is continuously extracted from sulfur bearing ore, found or brought to the surface, by conveying said ore through a conduit containing a downstream sulfur extraction section. After sulfur is extracted, the residual trailings are further conveyed upstream through a second conduit to an exit point.

3,619,147

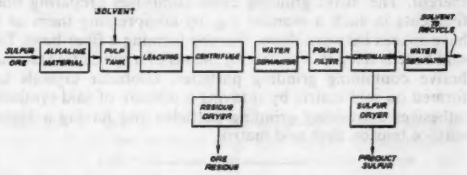
SULFUR EXTRACTION IN PRESENCE OF AN ALKALINE MATERIAL AND INCLUDING WATER SEPARATION, SOLVENT RECYCLE AND DRY SEAL VAPOR LOCK

Carl K. Amano, Denver, and Clifford J. Lewis, Lakewood, both of Colo., assignors to Brameda Resources Limited, Vancouver, British Columbia, Canada

Filed June 12, 1969, Ser. No. 838,723

Int. Cl. B01d *9/02*, *11/02*; C01b *17/08*

U.S. Cl. 23—299 **5 Claims**

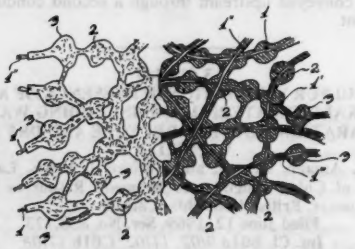


This invention relates to a process and apparatus wherein a solvent for dissolving and recovering sulfur from sulfur bearing ore or concentrate may be continuously recycled and reused without loss. The invention further involves a closed, sealed system so constructed as to prevent the loss of any solvent during the processing of the sulfur ore or concentrate while, nevertheless, obtaining pure sulfur from each cycle. The process and apparatus of the present invention provide means for initially leaching a crushed sulfur ore or concentrate and thereafter passing the resultant slurry to a separator for the separation of the leached residue from the sulfur saturated or rich solvent. Thereafter, water is separated from the sulfur saturated solvent and the solvent is fed into a crystallizer from which extremely pure elemental sulfur is obtained. After passing through the crystallizer, the elemental sulfur is separated from the solvent, the sulfur is dried, resulting in a pure end product and the solvent is recycled to the initial steps of the process. At each point in the processing operation, wherein vaporized solvent may be present, the solvent vapors are returned to a condenser and thereafter recycled as practically pure solvent to the system. The leached residue itself is recovered in such condition that whatever minerals are present are sulfur-free and such minerals are easily recoverable.

3,619,148
METALLURGICAL COKE
Thomas J. Wilde, Fullerton, Calif., assignor to Republic Carbon Products Company Inc., Chicago, Ill.
Division of Ser. No. 714,398, Mar. 4, 1968, Pat. No. 3,444,047, which is a continuation-in-part of application Ser. No. 547,683, Apr. 1, 1966, now pending, which is a continuation-in-part of application Ser. No. 329,090 Dec. 9, 1963. Filed Apr. 9, 1969, Ser. No. 814,706
Int. Cl. C10l 5/16; C21b 5/00
U.S. Cl. 44—23 8 Claims

Metallurgical coke is made from carbon particles by heating the particles to shrink them. Thereafter, the shrunk carbon particles are mixed with a carbonaceous binder and formed into lumps which are heated in a nonoxidizing atmosphere to drive off volatiles and carbonize the binder.

3,619,149
GRINDING CLOTH AND METHOD FOR THE PREPARATION THEREOF
Noboru Kitazawa, No. 4-10, 2-chome, Daitakubo, Urawa-shi, Saitama-ken, Japan
Filed Nov. 18, 1969, Ser. No. 877,771
Int. Cl. B24d 11/02; C08g 51/12
U.S. Cl. 51—294 4 Claims



The present invention relates to a grinding cloth of excellent grinding properties and process for the preparation thereof. The novel grinding cloth comprises preparing fiber filaments in such a manner e.g. by compressing them as to have spaces between them, thereby forming a fiber base. The said base is fixed in a matrix by means of a synthetic resin adhesive containing grinding particles. Globular crystals are formed on said matrix by spraying a mixture of said synthetic adhesives containing grinding particles and having a higher surface tension than said matrix.

3,619,150
ABRASIVE ARTICLE AND NONLOADING COATING THEREFOR
Royden Carrington Rinker, Sidney, N.Y., and Joseph Michael Biglin, Manchester, Conn., assignors to The Borden Company, New York, N.Y.
Continuation of application Ser. No. 599,396, Dec. 6, 1966, now abandoned. This application Sept. 22, 1969, Ser. No. 860,122
Int. Cl. B24d 1/00; C08g 51/12
U.S. Cl. 51—295 6 Claims

A flexible coated abrasive article is formed having a nonloading coating applied over the size coating, said nonloading coating comprising a mixed resin composition of a thermosetting resin and either a thermoplastic or elastomeric resin and a water-dispersible metallic soap dispersed throughout said resin composition.

3,619,151
PHOSPHATE BONDED GRINDING WHEEL
Herbert D. Sheets, Jr., and Martin J. O'Hara, both of Columbus, Ohio, assignors to Landis Tool Company, Waynesboro, Pa.
Filed Oct. 16, 1968, Ser. No. 768,184
Int. Cl. B24d 3/02
U.S. Cl. 51—307 7 Claims

An abrasive grit/phosphoric acid/fine alumina molding composition, containing at least 0.4 percent by weight of finely divided ferric oxide for cold-pressing and subsequent heat-curing to a body containing abrasive grit particles held together by a water-insoluble phosphate binder; preparation of the body through employment of said amount of the ferric oxide particles with the subsequent heat-curing including a precuring of cold-pressed molding composition at 170° F. to 250° F. for ¾ to 3 hours; and the abrasive body thereby produced.

3,619,152
CUTTING TOOL WITH BORON FILAMENT COMPOSITE
Stanley A. Yalof, Escondido, and Ray T. Williams, San Diego, both of Calif., assignors to Tetrahedron Associates, San Diego, Calif.
Filed Sept. 16, 1969, Ser. No. 858,265
Int. Cl. C04b 31/16
U.S. Cl. 51—309 6 Claims

A cutting tool comprising a support body with a boron filament composite cutting edge.

ERRATA

For Classes 65—152 and 65—162 see:
Patent Nos. 3,619,158 and 3,619,159

3,619,153
PHOTOCONDUCTIVE ELEMENT AND PROCESS EMPLOYING A SUBSTITUTED SILYLISOBUTYLETHYLENEDIAMINE-ADHESIVE INTERLAYER
Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed May 24, 1968, Ser. No. 731,743
Int. Cl. G03g 5/00; B05b 1/06; B44d 1/09
U.S. Cl. 96—1.5 R 11 Claims

An electrophotographic plate comprising an electrically conductive substrate material overcoated with an interlayer material comprising a substituted silylisobutylethylenediamine, said interlayer, in turn, being coated with an overlayer comprising selenium and a method of preparing and process of using said plate are disclosed.

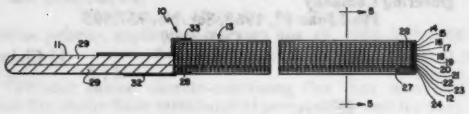
3,619,154
INFRARED SENSITIZATION OF PHOTOCONDUCTIVE COMPOSITIONS EMPLOYING CYANINE DYES
Giancarlo A. Cavagna, Adelphi; Asa Leifer, Beltsville; Fredric N. Miller, Laurel, and Frederick J. Vermillion, Jr., Wheaton, all of Md., assignors to Westvaco Corporation, New York, N.Y.
Filed July 30, 1968, Ser. No. 748,772
Int. Cl. G03g 5/00; G03c 1/08
U.S. Cl. 96—1.7 R 11 Claims

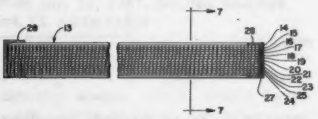
Photoconductive compositions comprising zinc oxide are sensitized in the near infrared region of the spectrum by near infrared-sensitizing cyanine dyes. The dyes adsorb onto the surface of zinc oxide and render it photosensitive to wavelengths of light above 700 millimicrons.

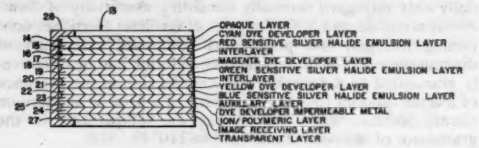
3,619,155
PHOTOGRAPHIC PRODUCTS AND PROCESSES UTILIZING A POLYVALENT METAL ION-CROSS-LINKED POLYMERIC LAYER

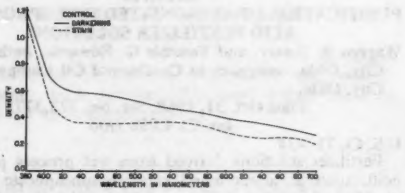
Richard W. Young, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

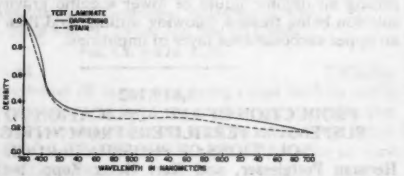
Filed June 1, 1970, Ser. No. 42,394
Int. Cl. G03c *5/54, 7/00*
U.S. Cl. 96—3 **54 Claims**











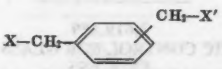
A photographic film unit adapted to be processed by passing said unit between a pair of juxtaposed pressure-applying members which includes a composite structure composed of a plurality of layers including a photosensitive silver halide emulsion layer having associated therewith a dye image-forming material which is processing composition soluble and diffusible as a function of exposure of the photosensitive silver halide emulsion layer to incident actinic radiation; a polymeric layer dyeable by said dye image-forming material; opacifying means adapted to be interposed intermediate the dyeable polymeric layer and next adjacent silver halide emulsion layer and associated dye image-forming material in a quantity adapted to mask dye image-forming material in a quantity adapted to mask dye image-forming material associated with the silver halide emulsion layer subsequent to photoexposure of the emulsion; a substantially continuous polymeric layer having associated therewith a metal ion; e.g., a metal ion cross-linked polymeric layer, adapted to be interposed intermediate the dyeable polymeric layer and next adjacent silver halide emulsion layer and associated dye image-forming material, subsequent to substantial dye image formation by transfer of dye image-forming material from association with the silver halide emulsion layer to the dyeable polymeric layer and to restrain transfer of dye image-forming material and other products of the development process which effect stability and/or quality of the image; and a rupturable container containing processing composition and adapted to discharge its contents between said dyeable polymeric layer and the photosensitive silver halide emulsion layer.

3,619,156
COMPETING COLOR DEVELOPER COMPOSITION

Atsuaki Arai; Mitsugu Tanaka; Haruhiko Iwano, and Isao Shimamura, all of Minami-Ashigara-Machi, Ashigara-Kamigun, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 20, 1969, Ser. No. 835,216
Claims priority, application Japan, June 20, 1968, 43/42840
Int. Cl. G03c *7/16, 7/00*
U.S. Cl. 96—22 **18 Claims**

A color developer composition comprising a primary aromatic amino developing agent, a color-forming coupler, an alkali, and a water-soluble competing developing agent having the formula:



wherein X and X' each represents a p-hydroxyanilino group of which the benzene ring may further be substituted by a member selected from the class consisting of an alkyl group having from one to four carbon atoms, a hydroxyalkyl group having from one to four carbon atoms, an alkoxy group having from one to four carbon atoms and a halogen atom, and the X'–CH_2–group may be located at the o-, m- or p-position to the position of the X–CH_2–group.

An improved color reversal development of a multilayer, multicolor photographic element is also claimed, where the improvement comprises utilizing, in at least one color developer used in the process, a water-soluble competing developing agent as above described.

Further described is a composition for preparing a color developer solution comprising a primary aromatic amino developing agent and the water-soluble competing developing agent described above.

3,619,157
THERMO RECORDING

Eric Maria Brinckman, Mortsel, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Oct. 24, 1967, Ser. No. 677,759
Claims priority, application Great Britain, Oct. 24, 1966, 47,626/66
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 **9 Claims**

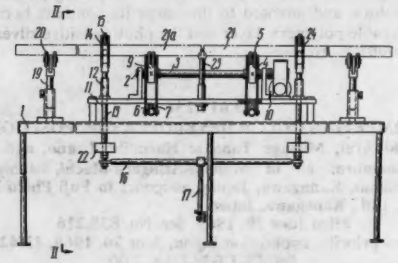
A recording material composed of an opaque dispersion of nonpolymeric fatty or waxy material in a binder containing a pigment that absorbs light and converts it to heat becomes clear in areas exposed to light.

3,619,158

APPARATUS FOR WELDING GLASS RODS, PARTICULARLY TUBULAR GLASS RODS

Albert Musagitovich Akhunov, ulitsa Gogolya, 53, kv. 8, Bugulma; Raekhat Maxutov, ulitsa Tukaeva, 75a, kv. 35, Bugulma; Yakov Ferdorovich Gubarev, ulitsa Gogolya, 51, kv. 8, Bugulma; Mansur Abdullovich Zalyaliev, ulitsa Shevchenko, 53, kv. 43, Bugulma; Ilgiz Mullayanovich Sabirov, ulitsa Petrovskaya, 10, kv. 5, Bugulma, and Khalida Khatimovna Imamutdinova, ulitsa Kuibysheva, 32, kv. 15, Leninogorsk, all of U.S.S.R.

Filed Mar. 23, 1970, Ser. No. 21,752
Claims priority, application U.S.S.R., Mar. 31, 1969, 1,321,697
Int. Cl. C03b *29/04*
U.S. Cl. 65—152 3 Claims



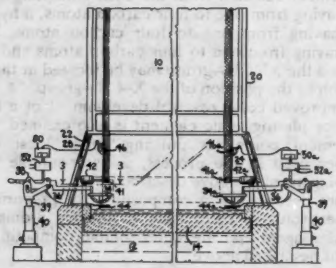
An apparatus for welding glass rods, particularly, glass rods of a hollow tubular shape, wherein the operation of reciprocating the rods being welded longitudinally, simultaneously with their rotation about the longitudinal axes thereof, is mechanized.

3,619,159

AUTOMATIC CONTROL FOR GLASS DRAWING PROCESS

Daniel A. Shirley, Mount Zion, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 641,879, May 29, 1967, now abandoned. This application June 30, 1970, Ser. No. 56,035
Int. Cl. C03b
U.S. Cl. 65—162 5 Claims



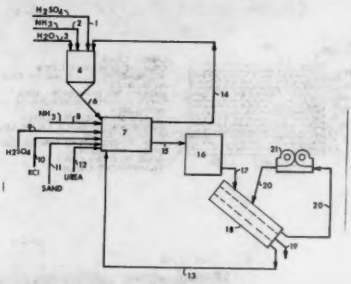
The width of a continuous sheet of glass is maintained substantially constant by automatically controlling the temperature of the edges of the sheet in the forming region. A controller, regulating heating and/or cooling means positioned in heat exchange relationship with an edge of the sheet receives signals from a radiant energy sensor responsive to changes in the lateral position and/or radiant energy emanating from an area of the edge, and regulates the thermal energy supplied to or removed from the edge of the sheet in a portion thereof that is of rapidly changing viscosity, i.e., i.e., between the meniscus and the point at which the glass has cooled to the top of its annealing range in accordance with the changes detected to maintain the temperature of the edge and the width of the sheet substantially constant.

3,619,160

PROCESS FOR GRANULATING X-O-O AND X-O-Y GRADES OF FERTILIZER

James E. Gabrielson, Mundelain, Ill., and Leonard Berkowitz, Berkeley Heights, N.J., assignors to Esso Research and Engineering Company

Filed June 17, 1968, Ser. No. 737,595
Int. Cl. C05c *9/00*
U.S. Cl. 71—30 11 Claims



X-O-O grades of fertilizer (fertilizer containing substantially only nitrogen) normally consisting essentially of diammonium sulfate and X-O-Y grades of fertilizer (fertilizer containing nitrogen and potassium) composed essentially of diammonium sulfate and potassium chloride can be effectively granulated to a desirable commercial size in the presence of a small amount (5-12 wt. percent) of a urea or ammonium nitrate additive while maintaining the temperature in the granulator of between about 150° to 210° F.

3,619,161

PURIFICATION OF AMMONIATED SUPERPHOSPHORIC ACID FERTILIZER SOLUTIONS

Warren A. Knarr, and Tommie G. Edwards, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 31, 1968, Ser. No. 772,377
Int. Cl. C05b *1/06*
U.S. Cl. 71—34 1 Claim

Fertilizer solutions derived from wet process phosphoric acid, such as ammoniated superphosphosphoric acid, are clarified of carbonaceous impurities by admixing with a small amount of a water-immiscible organic stratifying agent comprising an organic liquid of lower specific gravity than the solution being treated, allowing settling, and then separating an upper carbonaceous layer of impurities.

3,619,162

PRODUCTION OF AND APPLICATION TO SOIL SUSPENSION FERTILIZERS FROM NITRIC ACID SOLUTIONS OF PHOSPHATE ROCK

Herman Pottgiesser, and Karl Heinz Zapp, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Apr. 4, 1969, Ser. No. 813,749
Claims priority, application Germany, Apr. 5, 1968, P 17 67 140.8
Int. Cl. C05b *11/06, 11/12*
U.S. Cl. 71—37 6 Claims

To prepare suspension fertilizers from nitric acid solutions of phosphate rock the solutions are neutralized in an already neutralized solution in a vessel by means of ammonia and/or an ammonium salt of carbonic or carbamic acid, a pH of from seven to 10 and a temperature of from 10° to 50° C. being maintained. During or immediately after the neutraliza-

tion, substances containing carbonate ions and/or forming carbonate ions in solution are introduced. The finished suspension should have a $CO_3^{(-)}$ content of at least 0.2 percent by weight.

3,619,163
METHOD OF REDUCING THE CAKING TENDENCY OF FERTILIZERS
Aage J. Alertsen, Haslum, Norway, assignor to Elektrokemisk A/S, Oslo, Norway
Filed Jan. 14, 1969, Ser. No. 791,138
Claims priority, application Norway, Jan. 19, 1968, 227/1968
Int. Cl. C05g *3/00*
U.S. Cl. 71—64 E **2 Claims**
Colloidal silicon dioxide-containing flue dust recovered from the smoke from metallurgical processes is used for coating of the grains of particulate fertilizers to reduce the tendency for the particles of the fertilizer to cake.

3,619,164
METHOD OF CONTROLLING GROWTH OF WOODY JUNGLE PLANTS
William A. Erby, Alburtis, and Robert A. Walde, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.
Continuation-in-part of application Ser. No. 541,096, Apr. 8, 1966. This application July 21, 1967, Ser. No. 654,989
Int. Cl. A01n *13/00*
U.S. Cl. 71—70 **4 Claims**
Application of effective amounts of 2,3,5,5,5 pentachloro-4-keto pentenoic acid, along or in synergistic combination with arsenic acid or dimethyl arsenic acid to woody jungle plants in situ causes quick wilting of leaves and subsequent defoliation of the plants which action makes observation of the jungle floor possible over a long period of time which begins shortly after application with the onset of wilting.

3,619,165
ALKYNL CARBOXYLATES AND THEIR USE FOR KILLING MERISTEMATIC BUDS
Rupert A. Covey, Wolcott, and Charles E. Crittendon, Hamden, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.
Filed Oct. 20, 1967, Ser. No. 676,728
Int. Cl. A01n *9/00*
U.S. Cl. 71—70 **13 Claims**
The invention concerns a composition containing an alkynyl carboxylate and its use for killing meristematic tissue on ornamental and agricultural plants.

3,619,166
METHOD OF INCREASING SUGAR CONTENT OF CROPS
Bruno Quebedeaux, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 1, 1969, Ser. No. 812,398
Int. Cl. A01n *9/36*
U.S. Cl. 71—86 **7 Claims**
The sugar content of sugar-containing crops such as sugar cane, can be increased by applying to the crops an effective amount of carbamoylphosphonate such as ammonium ethyl carbamoylphosphonate from two to eight weeks prior to normally scheduled harvest.

3,619,167
HERBICIDAL COMPOSITIONS CONTAINING BIPYRIDYLIUM SALTS WITH REDUCED CORROSIVENESS TOWARD METALS
Gordon James Marrs, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Sept. 16, 1968, Ser. No. 762,350
Claims priority, application Great Britain, Sept. 27, 1967, 43,928/67
Int. Cl. A01n *9/22*
U.S. Cl. 71—94 **6 Claims**
Herbicidal compositions of bipyridylium diquaternary salts and a dithiophosphorous acid derivative. Examples of such derivatives are the salts of alkyl esters of dithiophosphoric acid.

3,619,168
METHOD FOR KILLING UNDESIRABLE PLANT GROWTH
Kenneth T. Mecklenborg, and Kenneth H. Pettengill, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio
Filed July 24, 1967, Ser. No. 655,296
Int. Cl. A01n *9/24*
U.S. Cl. 71—106 **6 Claims**
A post-emergence herbicidal composition is provided which comprises an emulsion containing water, a nonionic emulsifier, and an aliphatic, organic ester prepared from aliphatic monocarboxylic acids containing four to 22 carbon atoms and lower aliphatic alcohols containing one to 10 carbon atoms. The herbicides are effective in killing such weeds as mustard, foxtail, crabgrass and pigweed, and can be made selective so as to have no substantial adverse effect on certain desired crops such as beans and peanuts while being toxic to certain undesirable plants.

3,619,169
METHOD OF INCREASING THE RECOVERABLE SUGAR FROM SUGAR BEETS
Warren H. Zick, Pittsburgh, Pa., assignor to Velsicol Chemical Corporation, Chicago, Ill.
Filed Apr. 23, 1969, Ser. No. 818,828
Int. Cl. A01n *9/24*
U.S. Cl. 71—107 **7 Claims**
This invention discloses a method of increasing the recoverable sugar from sugar beets which comprises contacting the beet plants with an effective amount of an alkyl ester of 2-methoxy-3,6-dichlorobenzoic acid.

3,619,170
COPPER INFILTRATING COMPOSITION FOR POROUS FERRUGINOUS PARTS
Ernest L. Fisher, Crown Pt., and Glen D. Kole, Hammond, both of Ind., assignors to SCM Corporation, Cleveland, Ohio
Filed July 24, 1969, Ser. No. 844,660
Int. Cl. B22f *1/00*
U.S. Cl. 75—.5 R **10 Claims**
Disclosed is an infiltrating composition for infiltrating iron compacts. The infiltrating composition is a conventional copper-based infiltrating powder containing a small amount of iron-chromium alloy as a release agent to prevent adhesion of the infiltrating slug residue to the infiltrated iron compact.

3,619,171
METHOD AND A MIXTURE FOR THE PREPARATION OF AN IRON MELT WITH A LOW SULPHUR CONTENT
Hermanus Bakkerus, Voorburg, and Bernardus J. J. van der Holst, Delft, both of Netherlands, assignors to Nederlandse Organistie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands
Filed Dec. 2, 1968, Ser. No. 780,555
Claims priority, application Netherlands, Dec. 5, 1967, 6716522 Germany, Nov. 6, 1968, P 18 07 332.0
Int. Cl. C21c *7/02*
U.S. Cl. 75—55 **18 Claims**
(1) A method for the preparation of an iron melt with a low sulfur content wherein a mixture is added to the melt, the mixture comprising Na_2CO_3, calcium compounds and a quantity by weight of NaCl which is at least one-third and at most three times the quantity (by weight) of Na_2CO_3 while, of the total mixture, at least one-third consists of calcium compounds and (2) said mixture for adding to an iron melt.

3,619,172
PROCESS FOR FORMING SPHEROIDAL GRAPHITE IN HYPEREUTECTOID STEELS

Noel Lutgen, Sucy en Brie, and Pierre Karinthi, Champigny sur Marne, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude

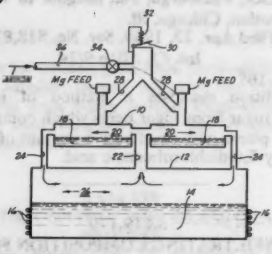
Continuation of application Ser. No. 662,939, Aug. 24, 1967, now abandoned. This application Apr. 24, 1970, Ser. No. 29,751
Int. Cl. C22c *37/04*; C21c *1/10*
U.S. Cl. 75—59 4 Claims

Process for improving the castability and the mechanical characteristics of iron-carbon alloys containing between 0.8 and 2.5% by weight of carbon by precipitating at least part of the carbon in excess of that of the eutectoid in the form of spheroidal graphite. This process comprises injecting into the molten iron alloy argon or other rare gas in the form of a multitude of very fine bubbles.

3,619,173
METHOD FOR THE CONTROLLED ADDITION OF VOLATILE TREATING MATERIALS

Norman A. D. Parlee, Los Altos Hills, and William E. Mahin, Oakland, both of Calif., assignors to Kaiser Industries, Inc., Oakland, Calif.

Filed Feb. 18, 1969, Ser. No. 800,074
Int. Cl. C21c *7/00*; C22b *9/00*
U.S. Cl. 75—59 7 Claims

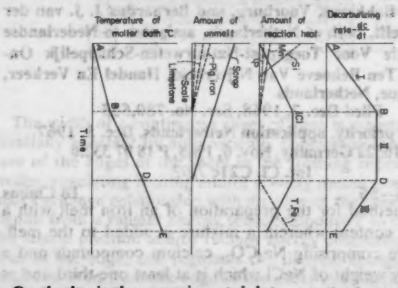


A process for adding volatile treating materials to molten metals with control of the final concentration of the material in the metal to remove impurities therefrom, and to impart advantageous properties to the metal.

3,619,174
METHOD FOR CONTROLLING THE CARBON CONTENT IN AND/OR THE TEMPERATURE OF THE STEEL

Takehiko Fujii; Taiji Araki, and Katsukiyo Marukawa, all of Wakayama-shi, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 592,830, Nov. 8, 1966, now abandoned. This application June 6, 1969, Ser. No. 843,884
Claim priority, application Japan, Nov. 27, 1965, 40/73041
Int. Cl. C21c *5/32*
U.S. Cl. 75—60 2 Claims



On the basis the experimental data, constants are predetermined to establish the decarburizing rate of a ferrous metal bath in a refining vessel in three successive oxygen blowing periods constituting the refining cycle. The model provided by the three equations determining the decarburizing rates is then used to control the refining time so as to obtain a steel of the desired carbon content from the charge of a given carbon content.

3,619,175
REFINING OF MOLTEN METAL

Herbert Greenewald, Jr, Upper Arlington, Ohio, assignor to Berry Metal Company, Harmony, Pa.

Filed Nov. 18, 1969, Ser. No. 877,872
Int. Cl. C21c *5/28*; C22b *9/00*
U.S. Cl. 75—60 12 Claims

A method of refining molten metal, especially steel, utilizes improved apparatus for injecting gaseous treating media such as oxygen into the molten metal. The apparatus is provided with an internally-cooled nozzle that directs the gaseous medium into the molten bath and that is fabricated of an improved copper alloy to thereby significantly reduce the frequency of required apparatus replacement during the metallurgical processing.

3,619,176
ALUMINUM AMALGAM PREPARATION

Robert G. Briody, and Ephraim A. Cuevas, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 23, 1969, Ser. No. 860,239
Int. Cl. C22b *21/00*
U.S. Cl. 75—68 R 9 Claims

A method of preparing aluminum amalgam or aluminum-mercury mixtures is described in which mercury vapors are passed through a bed of aluminum particles contained in a chamber. The particles are removed from the chamber after thorough contact with the mercury and washed in an inert, organic, oxygen-free liquid to remove excess mercury. The particles are described as useful as a catalyst in the manufacture of tetramethyl lead.

3,619,177
PROCESS FOR DEOXIDIZING COPPER WITH NATURAL GAS-AIR MIXTURE

Russell R. Beck; Charles W. Anderson, and Martin E. Messner, all of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed May 5, 1969, Ser. No. 821,800
Int. Cl. C22b *9/08*, *15/00*, *15/14*
U.S. Cl. 75—76 8 Claims

A process for reducing the oxygen content of molten copper. A mixture of natural gas and air is introduced under the surface of a bath of molten copper, wherein the natural gas reacts with the oxygen in the air to partially oxidize the hydrocarbon constituents of the natural gas to form a reducing gas mixture containing hydrogen and carbon monoxide. The reducing gas mixture reduces the oxygen contained in the copper. In a preferred embodiment, air is introduced over the surface of the bath to react with unreacted material emanating from the surface of the bath, forming a reducing gas mixture over the bath which aids in reducing the oxygen content of the copper and decreases the emission of pollutants into the atmosphere.

3,619,178
PROCESS FOR DIRECTLY REDUCING PLUTONIUM DIOXIDE TO PLUTONIUM

Rowland E. Felt, Richland, Wash., assignor to The United States of America as Represented by the United States Atomic Energy Commission.

Filed Nov. 14, 1969, Ser. No. 877,039
Int. Cl. C22b *61/04*
U.S. Cl. 75—84.1 4 Claims

Plutonium dioxide is reduced to plutonium metal by adding the plutonium dioxide and calcium to a flux consisting of 5 to 20 weight percent calcium fluoride and 95 to 80 weight percent calcium chloride held at about 800° C. The plutonium dioxide and calcium may be added simultaneously

or sequentially; however, the weight of unreacted plutonium dioxide in the flux must never exceed 20 percent of the weight of the flux and no more than a slight excess of calcium may be present in the flux. The plutonium metal is removed to one vessel and the salt removed to another where it is contacted with calcium–30 weight percent zinc to remove residual plutonium therefrom.

3,619,179

AGE-HARDENING MARTENSITIC STEELS

Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 22, 1969, Ser. No. 818,445
Int. Cl. C22c *39/20*
U.S. Cl. 75—124 **4 Claims**

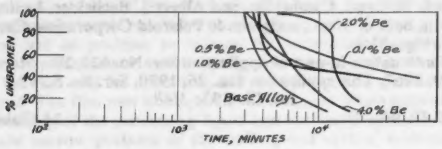
Age-hardening martensitic steel consisting essentially of 0.2% to 0.6% carbon, 4% to 6% chromium, 1% to 2% molybdenum, 0.2% to 0.8% vanadium, 0.25% to 3% aluminum and 2% to 7% nickel.

3,619,180

STRESS-CORROSION-RESISTANT ALLOY

Roger W. Staehle, Columbus, Ohio, and Juan Royuela, Madrid, Spain, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 6, 1968, Ser. No. 781,802
Int. Cl. C22c *37/10, 39/02*
U.S. Cl. 75—124 **7 Claims**



An austenitic stainless alloy which is resistant to stress-corrosion cracking containing 18–23 atomic percent chromium, 12–18 atomic percent nickel, and 0.2–1.5 atomic percent beryllium, the amount of nitrogen being limited to not greater than 200 parts per million. The alloy may also include 0.5–3.0 atomic percent aluminum and/or 0.05–0.2 atomic percent carbon.

3,619,181

ALUMINUM SCANDIUM ALLOY

Lowell A. Willey, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 474,470, July 23, 1965, now abandoned. This application Oct. 29, 1968, Ser. No. 771,669
Int. Cl. C22c *21/00*; **C22f** *1/04*
U.S. Cl. 75—138 **35 Claims**

Aluminum and aluminum alloys of varying binary, ternary and multicomponent types having from 0.01 to about 5.0 percent by weight of scandium characterized by improved physical properties and methods of thermally treating the same.

3,619,182

CAST NICKEL-BASE ALLOY

Clarence G. Bieber, Suffern, and John J. Galka, Tuxedo, both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed May 31, 1968, Ser. No. 733,318The portion of the term of the patent subsequent to Aug. 5, 1986, has been disclaimed.
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **9 Claims**

A cast alloy containing for example 0.2 percent carbon, 13 percent chromium, 10 percent cobalt, 2 percent molybdenum, 4 percent tungsten 4 percent tantalum 3 percent aluminum, 4.5 percent titanium, 0.02 percent boron, 0.1 percent zirconium, balance essentially nickel, has an unusual combination of properties at elevated temperatures including high stress-rupture strength, high resistance to the effects of oxidation and sulfidation, and structural stability.

3,619,183

NICKEL-BASE ALLOYS ADAPTABLE FOR USE AS STEAM TURBINE STRUCTURAL COMPONENTS

John H. Olson, Franklin Lakes, N.J., and Jere H. Brophy, Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 21, 1968, Ser. No. 714,764
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **3 Claims**

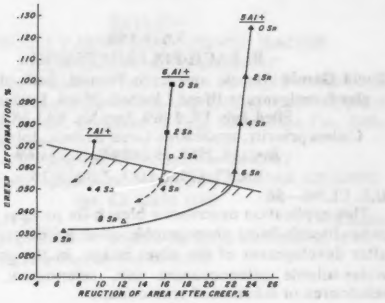
Nickel-base alloys containing correlated amounts of aluminum, titanium, columbium, molybdenum and tungsten, adaptable for use as structural components (notably steam turbine bolts) at temperatures on the order of 1000° F. Alloys, which also contain iron and usually carbon, afford specified minimum room and elevated temperature yield strengths and other desirable metallurgical characteristics.

3,619,184

BALANCED TITANIUM ALLOY

Howard B. Bomberger, Jr., Canfield, and Stanley R. Seagle, Warren, both of Ohio, assignors to Reactive Metals, Inc.

Filed Mar. 14, 1968, Ser. No. 713,214
Int. Cl. C22c *15/00*
U.S. Cl. 75—175.5 **4 Claims**



A titanium alloy containing aluminum, zirconium, silicon, at least one stabilizer from the group consisting of molybdenum, columbium, tantalum, vanadium and tungsten and which may also contain tin, all balanced in accordance with prescribed relationships.

ERRATUM

For Class 95—44 C see:
Patent No. 3,619,202

3,619,185

PHOTOGRAPHIC PROCESSING COMPOSITIONS AND PROCESSES USING SAME

Sidney Kasman, Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 29, 1968, Ser. No. 725,145
Int. Cl. G03c *5/30, 5/54*
U.S. Cl. 96—29 R **10 Claims**

The shelf life of photographic developing compositions containing N-alkoxyalkyl substituted hydroxylamines is increased by addition of an oxyethylamino compound of the group consisting of triethanolamine, morpholine, N-ethylmorpholine, ethanol amine, 3-diethylamino-1,2-propanediol,N,N-diethylaminoethanol, tris-2-propanolamine, N,N-dihydroxyethylglycine and cellulose diethylaminoethyl ether.

3,619,186

PHOTOGRAPHIC DIFFUSION TRANSFER PRODUCT AND PROCESS

Timothy F. Parsons, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1969, Ser. No. 796,560
Int. Cl. G03c 5/54
U.S. Cl. 96—29 19 Claims

A receiving layer for use in a photographic diffusion transfer process comprises a proteinaceous colloid binder, a silver precipitant, a water-soluble polyvinyl quaternary salt containing a five or six membered heterocyclic nucleus containing a quaternary nitrogen atom and an iodide. The layer can also contain a silver salt or complex for improving image density and/or a toning agent.

3,619,187

PROCESS FOR PREPARING COLORED PHOTORESISTS

Edward Cerwonka, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Feb. 12, 1968, Ser. No. 704,521
Int. Cl. G03c 1/68
U.S. Cl. 96—35.1 13 Claims

Photopolymerizable compositions containing a polymerizable ethylenically unsaturated compound, a ferric salt, a peroxy compound and an alpha-hydroxycarboxylic acid, and their use in preparing photoresists.

3,619,188

BLEACH-FIX PROCESSING

David Gerald Alcock, and Enzo Piccotti, both of Ilford, England, assignors to Ilford Limited, Ilford, England

Filed July 18, 1969, Ser. No. 843,183
Claims priority, application Great Britain, July 24, 1968, Apr. 14, 1969, 35,340/68, 18,934/69
Int. Cl. G03c 5/32, 7/00, 5/26
U.S. Cl. 96—50 9 Claims

This application describes a bleach-fix process which comprises bleach-fixing photographic silver halide color material, after development of the silver image, in the presence of a water-soluble selenocyanate salt, selenourea, substituted selenourea or substituted selenouracil.

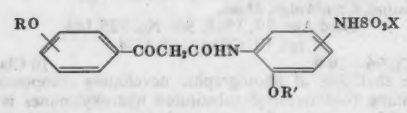
3,619,189

COLOR PHOTOGRAPHIC DEVELOPING PROCESS

Makoto Yoshida; Momotoshi Tsuda, and Isao Shimamura, all of Minami Ashigara-Machi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 21, 1970, Ser. No. 4,660
Claims priority, application Japan, Jan. 22, 1969, 44/4579
Int. Cl. G03c 7/00
U.S. Cl. 96—55 12 Claims

A color photographic developer and process utilizing same employing particular yellow couplers represented by the formula



wherein R and R′ may be the same or different and each represents an alkyl group having one to three carbon atoms and X represents an alkyl group, an aryl group, or a substituted aryl group.

3,619,190

SILVER HALIDE PHOTOGRAPHIC COLOR MATERIAL CONTAINING FLUORINE SUBSTITUTED BENZOYLACETAMIDE COLOR COUPLERS

Marcel Hendrick Verbrugghe, Kontich, and Raymond Albert Roosen, S-Gravenwezel, both of Belgium, assignors to Gevaert-Agfa N. V., Mortsel, Belgium

Filed Feb. 16, 1970, Ser. No. 11,816
Claims priority, application Great Britain, Mar. 19, 1969, 14,476/69
Int. Cl. G03c 7/00, 1/40
U.S. Cl. 96—55 6 Claims

Silver halide elements containing benzoylacetamide color couplers having a fluorine atom in the para-position of the benzoyl moiety.

3,619,191

DIAZO TYPE MATERIALS

Robert C. Desjarlais, South Hadley Falls, Mass., assignor to The Tecnifax Corporation, Holyoke, Mass.

Filed Sept. 13, 1967, Ser. No. 667,365
Int. Cl. G03c 1/60, 1/58, 1/54
U.S. Cl. 96—75 39 Claims

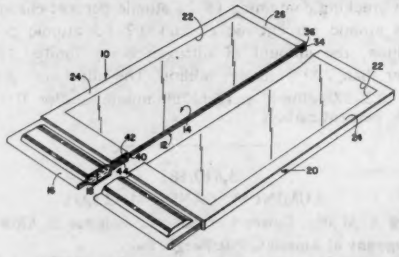
Light-sensitive diazo compositions containing light-sensitive diazonium derivatives of dialkoxy-substituted paraphenylene diamines, at least one coupling component for said diazonium derivatives, and at least one background discoloration inhibitor are disclosed.

3,619,192

PHOTOGRAPHIC FILM UNIT

Edwin H. Land, Cambridge, and Albert J. Bachelder, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 622,286, Mar. 10, 1967. This application Jan. 26, 1970, Ser. No. 5,799
Int. Cl. G03c 1/48
U.S. Cl. 96—76 14 Claims

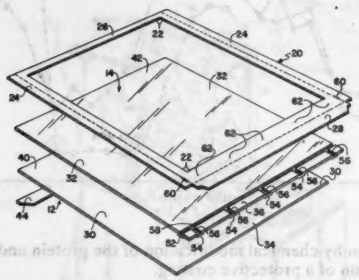


A photographic film unit comprising all of the materials required to produce a photographic print including a photosensitive element, a transparent image-receiving element, a container of processing liquid and a binding element secured to the exterior margins of the photosensitive and image-receiving elements adjacent three sides of the area to be exposed and processed. The binding element secures the photosensitive and image-receiving elements to one another along three sides of the exposure area and secures the container to the elements adjacent the remaining side of the exposure area. The film unit is designed to be maintained in tact throughout and subsequent to exposure and processing in which a processing liquid is discharged from the container and distributed in a layer between the photosensitive and image-receiving elements over the exposed area to form a transfer image between the elements. The external binding sheet functions to control the thickness of the layer of liquid insuring sufficient liquid at the edges of the exposed area to provide for complete image formation and providing a white border for the finished print. The image-receiving element is embossed at the borders of the image-receiving area.

3,619,193
PHOTOGRAPHIC FILM UNIT

Frank W. Knight, Salem, N.H., assignor to Polaroid Corporation, Cambfidge, Mass.

Filed Dec. 30, 1968, Ser. No. 787,749
Int. Cl. G03c *1/48*
U.S. Cl. 96—76 R 13 Claims



A self-developing film unit including a photosensitive sheet, a transparent second sheet, binding means for securing the sheets in face-to-face relation at the margins thereof with the trailing end section of the second sheet extending beyond the trailing edge of the photosensitive sheet, a container of processing liquid coupled with the sheets at one end of the film unit in position to release its contents for spreading between the sheets, and trapping means at the opposite end of the film unit for collecting and retaining excess processing liquid. The film unit is adapted to be retained intact following spreading of the processing liquid and the trapping means include narrow portions of the trailing end section embossed toward the photosensitive sheet to form longitudinal ribs providing liquid trapping spaces located between the trailing end section of the second sheet and the binding means.

3,619,194
NOVEL LIGHT-ABSORBING LAYERS FOR PHOTOGRAPHIC ELEMENTS CONTAINING SUBSTITUTED 1-AMINOPYRIDINIUM DYES, assignor to Gary F. Mitchell, Rochester, N.Y. and Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 832,847, June 12, 1969, now abandoned. This application Nov. 5, 1969, Ser. No. 874,389
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 25 Claims

Novel light-absorbing photographic layers containing substituted 1-aminopyridinium dyes are described. These layers are useful as filter and antihalation layers in photographic elements.

3,619,195
PHOTOGRAPHIC COUPLER DISPERSIONS

John H. Van Campen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,836
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 19 Claims

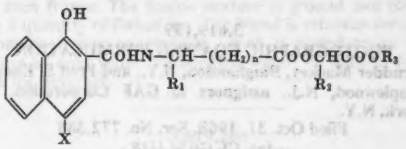
Water-insoluble organic solvent-soluble polymers are advantageously mixed with hydrophobic photographic couplers either alone or together with an auxiliary solvent to prepare a coupler composition that is valuable for dispersing in aqueous hydrophilic colloid silver halide emulsion for color photographic elements. The novel dispersions are valuable for preparing photographic elements because they have good sensitometric characteristics, produce layers having improved rigidity even in thin layers and give improved stability to coupler and dyes formed from couplers, as well as provide other improved physical characteristics.

3,619,196
LIGHT-SENSITIVE COLOR-PHOTOGRAPHIC EMULSIONS

Masakuni Iwama; Isaburo Inoue; Yutaka Takei; Toshihiko Yamamoto, and Takayo Endo, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1969, Ser. No. 868,579
Claims priority, application Japan, Oct. 24, 1968, 43/77030
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 6 Claims

A light-sensitive silver halide color-photographic emulsion, characterized by containing a cyan coupler represented by the general formula



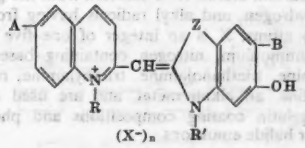
wherein R_1 is a hydrogen atom or a methyl group; R_2 is a hydrogen atom or an aliphatic hydrocarbon residue having one to 16 carbon atoms; R_3 is an aliphatic hydrocarbon residue having one to 18 carbon atoms; n is zero or 1; and X is a hydrogen atom, a halogen atom, or a substituted or unsubstituted phenylazo group.

3,619,197
OPTICALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Shiro Kimura; Yoshiyuki Nakazawa; Yasuharu Nakamura; Akira Sato; Masao Sawahara, and Katsuji Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 16, 1969, Ser. No. 842,361
Claims priority, application Japan, July 16, 1968, 43/50099
Int. Cl. G03c *1/10*
U.S. Cl. 96—132 4 Claims

A photographic silver halide emulsion containing a sensitizing dye represented by the formula:



wherein Z represents a member from the group consisting of a sulfur atom or a selenium atom; A represents a member from the group consisting of a hydrogen atom, a lower alkyl group or a hydroxyl group; B represents a member from the group consisting of a hydrogen atom or a lower alkyl group; R and R′ represent a member from the group consisting of a lower alkyl group or a substituted alkyl group, and at least one of R and R′ represent a member from the group consisting of a sulfoalkyl group or a carboxyalkyl group; X represents an anion; and n represents 0 or 1, n being 0 when the sensitizing dye is an intramolecular salt.

A photographic light-sensitive element comprising the above emulsion on a support is also claimed.

3,619,198

SILVER HALIDE EMULSIONS CONTAINING HYDROXY SUBSTITUTED ALICYCLIC COMPOUNDS

Nobuo Yamamoto; Akikazu Mikawa, and Minoru Sonoda, all of Kamagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 19, 1969, Ser. No. 834,880
Claims priority, application Japan, June 19, 1968, 43/42418
Int. Cl. G03c *1/28, 1/34*
U.S. Cl. 96—107 12 Claims

Silver halide photographic emulsions containing antifogging, sensitizing hydroxy-substituted alicyclic compounds.

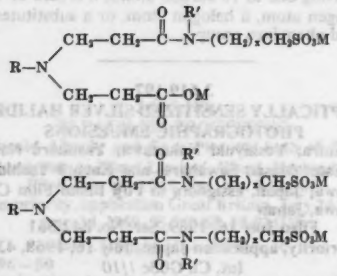
3,619,199

PHOTOGRAPHIC COATING FORMULATION

E. Scudder Mackey, Binghamton, N.Y., and Fred S. Elseman, Maplewood, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,388
Int. Cl. G03c *1/38*
U.S. Cl. 96—114.5 7 Claims

Novel amphoteric surfactants having the formulas:



wherein R is an aliphatic hydrocarbon radical having from eight to 20 carbon atoms, R′ is selected from the group consisting of hydrogen, and alkyl radicals having from one to four carbon atoms, X is an integer of one–five and M is hydrogen, ammonium, nitrogen containing bases such as diethanolamine, triethanolamine, triethylamine, morpholine and piperidine, an alkali metal, and are used as wetting agents in gelatin coating compositions and photographic gelatin silver halide emulsions.

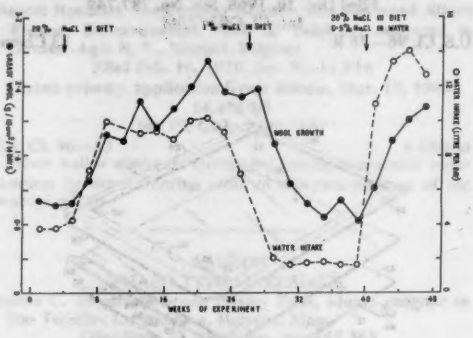
3,619,200

METHOD AND FOOD COMPOSITION FOR FEEDING RUMINANTS

Kenneth Adie Ferguson, West Pennant Hills, New South Wales, and David Henry Solomon, Glen Waverley, Victoria, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia

Filed June 20, 1967, Ser. No. 647,522
Claims priority, application Australia, May 1, 1967, June 21, 1966, 21096/67, 7198/66
Int. Cl. A61k *17/00, 21/00, 27/00*
U.S. Cl. 99—2 19 Claims

A feed or feed supplement for use in increasing the efficiency of protein production relative to feed intake in ruminants wherein a proteinaceous feed material of plant, animal or synthetic origin is rendered resistant to breakdown within



the rumen by chemical modification of the protein and/or the application of a protective coating.

3,619,201

PESTICIDE DECONTAMINATION OF ANIMAL FEED AND FOODS

Thomas E. Archer, Woodland, and Donald G. Crosby, Davis, both of Calif., assignors to The Regents of the University of California

Filed Oct. 24, 1967, Ser. No. 677,543
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 R 9 Claims

Reduction and elimination of agricultural chemicals whose permanent presence is undesirable in plant materials. The process involves one or more steps including (1) chemical destruction of agricultural chemical residues by treatment with hot alkali-alkanol wash, (2) wash of plant materials with solvent vapor, and (3) rapid dehydration of plant materials having a relatively high water content.

3,619,202

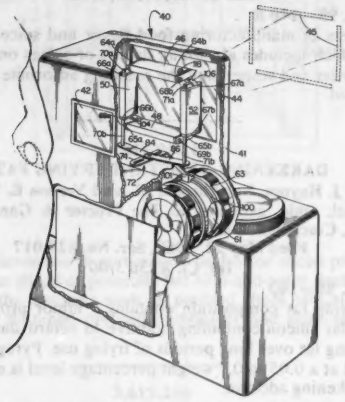
VARIABLE FRAME VIEWFINDER FOR PHOTOGRAPHIC CAMERA

Alfred H. Bellows, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 11, 1970, Ser. No. 45,417
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 C 12 Claims

A photographic camera has a variable focus objective lens and a novel variable frame viewfinder coupled to the focus control mechanism for the objective lens. The viewfinder includes a plurality of discrete reticles respectively defining linear framing marks, and a corresponding plurality of anamorphic reticle imaging means, one associated with each of the reticles, for projecting virtual images of the respective-

ly associated framing marks into the viewed field. The reticles and associated reticle means are positioned in associated pairs oriented to establish respective reticle projection axes diverging into the field from a viewfinder viewing location such that the virtual images of the framing marks cooperate when viewed in composite to frame a portion of the field. The anamorphic reticle imaging means are each disclosed as



comprising a cylindrical lens having an axis of zero power aligned with a slitlike window defined by the reticle, each of the lenses being positioned at most a focal length away from the associated window. Frame varying means coupled to the focus control mechanism causes the framed portion of the scene to vary in accordance with a predetermined program so as to compensate for sighting parallax errors and field size changes.

3,619,203

RIDDLING BOTTLED WINES

Adolf L. Heck, and Allan J. Hemphill, both of Korbel Ranch, Guerneville, Calif.

Division of Ser. No. 550,264, May 10, 1966, Pat. No. 3,533,602. Filed Oct. 2, 1969, Ser. No. 863,231

Int. Cl. C12g *1/00*

U.S. Cl. 99—48 **6 Claims**

A method of riddling bottled wine comprising holding a bottle of wine in an inverted and inclined position, shifting said bottle to a second inclined position with a different side of the bottle underneath, holding the bottle in the second position sufficiently long for sediment in the bottle contents to settle the desired amount, and shifting said bottle back to its original position; said shifting of the bottle being preferably accomplished without rotation of the bottle, but by swinging said bottle between said positions through a substantially vertical arc with the bottle being inclined at approximately 20° from the vertical in each of said positions, the bottle also preferably being vibrated between said shifting steps at a vibration of say approximately 3,000 cycles per minute.

3,619,204

PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING

Saul Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,156

Int. Cl. A23l *1/08*

U.S. Cl. 99—71 **3 Claims**

A new method of preparing an extract for freeze drying has been discovered which is readily adaptable for a continuous or a batch freeze drying system. The extract is passed through a continuous crystallizer and the slush formed therein is extruded into a vacuum. The extruded ropes are frozen to below the eutectic point of the extract in a vacuum chamber via evaporative cooling. The extruded ropes tend to expand or foam in the vacuum chamber and the expansion can be used as a means of controlling product density.

3,619,205

PROCESS OF PREPARING A SLUSH ICE BEVERAGE CONCENTRATE

Daniel J. LeVan, Nanuet; Barry E. Homler, Ossining, and Peter M. Bosco, Yonkers, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 20, 1968, Ser. No. 777,486

Int. Cl. A23l *1/00*; **A23g** *5/00*

U.S. Cl. 99—78 **3 Claims**

Sucrose, flavor, a water dispersible gum, an edible polyhydric alcohol, an edible food acid and water are mixed and then frozen. The frozen mixture is ground and blended with a quantity of flaked ice. The blend is refrozen forming a spoonable frozen concentrate which is added to an equal portion of cold water, carbonated water, or milk to form a slush ice beverage.

3,619,206

MODIFIED PROTEIN

Mervyn Thomas Arthur Evans, Lawrence, and Laurence Ian Irons, St. Albans, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,709

Claims priority, application Great Britain, Oct. 11, 1968, 48,379/68

Int. Cl. A23l *1/32*

U.S. Cl. 99—113 **11 Claims**

Egg yolk protein is acylated with the internal anhydride of a dicarboxylic acid to give an N-carboxyacylated egg yolk protein useful in preparing aqueous oil emulsions, such as salad dressings and mayonnaise, that are sterilizable by heat without coagulation.

3,619,207

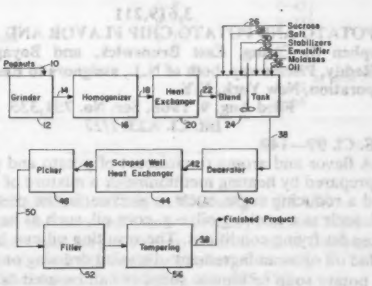
PEANUT BUTTER CONTAINING HOMOGENIZED PEANUT PASTE

Joseph W. Dzurik, Green Township, Hamilton County; Eddy R. Hair, Colerain Township, Hamilton; Michael E. Hardy, Cincinnati, and Edward R. Purves, Forest Park, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 14, 1969, Ser. No. 850,049

Int. Cl. A23l *1/38*

U.S. Cl. 99—128 **14 Claims**



A peanut paste ingredient for peanut butter has a maximum particle size of no more than 80 microns and has more than 50 percent of its particles in the 8–20 micron range. The best method for preparing this ingredient is by further size-reducing ground peanuts in a homogenizer utilizing particular pressures. The paste can contain more peanut skins than typical commercially available peanut butters contain and can be used in sweet peanut butter products without appearance or taste disadvantages.

3,619,208
PUDDING MIX COMPOSITION
Bernard J. Bahoshy; Robert R. Ferguson, and Joseph L. Hegadorn, all of Dover, Del., assignors to General Foods Corporation, White Plains, N.J.
Filed Aug. 21, 1968, Ser. No. 754,471
Int. Cl. A23l *1/14*
U.S. Cl. 99—139 11 Claims

A pudding mix composition includes, in combination with an amylaceous ingredient, a modified amylaceous ingredient. The preparation of a pudding therefrom is considerably simpler and is more tolerant of preparation errors.

3,619,209
PUDDING COMPOSITION CONTAINING LIPID ESTER
Joseph L. Hegadorn; Robert R. Ferguson, and Bernard J. Bahoshy, all of Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.
Filed Aug. 21, 1968, Ser. No. 754,470
Int. Cl. A23l *1/14*
U.S. Cl. 99—139 12 Claims

A pudding mix composition includes, in combination with an amylaceous ingredient, a lipid ester surface active agent. The preparation of a cooked pudding therefrom is considerably simpler and is more tolerant of recipe preparation errors in that the tendency of the pudding to stick to the pan and to scorch the pan during preparation is reduced or eliminated.

3,619,210
ORGANIC TRISULFIDE-CONTAINING CHOCOLATE FLAVOR COMPOSITIONS
Gunther M. Nakel, Springfield Township, Hamilton County, and George D. Hiler, Harrison Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 2, 1970, Ser. No. 400
Int. Cl. A23l *1/22*; A23g *1/00*
U.S. Cl. 99—140 R 10 Claims

Novel compositions of matter possessing a chocolatelike flavor and aroma, consisting essentially of a blend of certain sulfides, particularly certain organic trisulfides pyrazines, phenols and aldehydes in the appropriate percentages, the ratio of sulfur to nonsulfur compounds preferably being about 1:3500. Examples are given for a variety of preferred food products in which such novel compositions can be used to impart a chocolatelike flavor and aroma or to enhance a chocolate flavor and aroma already present.

3,619,211
POTATO AND POTATO CHIP FLAVOR AND AROMA
Stephen S. Chang, East Brunswick, and Boyapalle Rami Reddy, Piscataway, both of N.J., assignors to Research Corporation, New York, N.Y.
Filed Aug. 9, 1968, Ser. No. 751,335
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 5 Claims

A flavor and aroma reminiscent of potato and potato chip is prepared by heating methionine or a mixture of methionine and a reducing sugar, such as glucose, in the presence of an oil, such as a cooking oil, e.g. corn oil, such as heating under deep fat frying conditions. The resulting oil can be used as a salad oil or as an ingredient of a salad dressing or soups, such as potato soup or tomato soup, or can be used as a frying oil or applied to food products since the the resulting oil has a potato and potato chip flavor and aroma. A potato and potato chip flavor and aroma can also be imparted to foods, including food of animal or vegetable origin, including sea food, such as snack foods prepared from starch or flour, by applying or incorporating methionine in such foods followed by heating, such as deep fat frying. Additionally, a potato chip of improved taste can be obtained by adding methionine to potato slices and then frying in oil or by employing in the manufacture of potato chips a cooking or deep fat frying oil containing methionine or an admixture of methionine and a reducing sugar, such as glucose.

3,619,212
FOOD FLAVOR AND SPICE COMPOSITIONS AND THEIR PRODUCTION
Kazuo Mori, Osaka; Yasuo Yamamoto, Nara; Hideshi Noichi, Kyoto, and Yuichi Fukuda, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan
Filed Nov. 13, 1968, Ser. No. 775,522
Claims priority, application Japan, Dec. 29, 1967, 42/84848
Int. Cl. A23l *1/22*, *1/26*
U.S. Cl. 99—140 R 7 Claims

Process of manufacturing food flavor and spice compositions which includes absorbing flavors or spices onto an edible powder and suspending the resulting adsorbate in an edible liquid.

3,619,213
DARKENING-RESISTANT FRYING FAT
Donald J. Haynes, Northbrook, Ill., and Vernon E. Weis, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 22, 1969, Ser. No. 827,017
Int. Cl. A23d *5/00*
U.S. Cl. 99—163 10 Claims

A frying fat composition contains a minor proportion of particular silicon-containing additive to retard darkening in the frying fat over long periods of frying use. Pyrogenic silica utilized at a 0.05 to 0.7 weight percentage level is a preferred antidarkening additive.

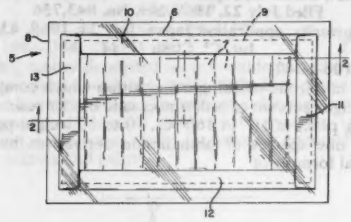
3,619,214
SELF-COOKING DISPOSABLE FOOD PACKAGES
Milton S. Cohen, Arlington, Mass., assignor to Battelle Development Corporation, Columbus, Ohio
Filed Dec. 16, 1968, Ser. No. 784,022
Int. Cl. B65d *81/34*
U.S. Cl. 99—171 H 23 Claims

A food package comprising a container whose interior surface defines a substantially closed cavity having a vapor vent in its upper portion, a pair of electrodes mounted within the lower portion of the cavity in spaced-apart relationship, and a food compartment disposed within the cavity above the electrodes.

3,619,215
HEAT-AND-SERVE PACKAGES FOR PREFRIED BACON AND THE LIKE
John C. Bard, and Russell H. Maas, both of Madison, assignors to Oscar Mayer & Company, Inc., Chicago, Ill.
Filed Nov. 12, 1968, Ser. No. 775,000
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 12 Claims

Heat-and-serve packages of prefried bacon and the like include a disposable, heatable tray formed with foldable sides from sheet material capable of retaining melted fat, with slices of prefried bacon or the like laid flatwise or shingled on the bottom of the tray. The sides of the tray are folded downwardly and inwardly over the margins of the sliced bacon and the assembly is enclosed in a disposable film envelope being preferably evacuated and hermetically sealed. In use, the outer film or envelope is removed, the sides of the tray are folded up and the tray is inserted in an oven or placed on a hot plate whereby the bacon is heated and

acquires the characteristic flavor of bacon fried or cooked in the usual manner. Single or multiple trays may be sealed in an envelope formed of barrier film. A single tray may be folded and multiple trays may be separable into smaller trays.



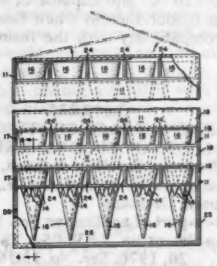
While the invention is particularly useful for sliced prefried bacon, other sliced or generally flat heat-and-serve items may constitute the contents such as prefried slices of Canadian bacon and flattened prefried hamburger and pork sausage patties.

3,619,216

ICE CREAM CONE FILLER SHEETS AND PACKAGE

David Weinstein, Baltimore, Md., assignor to Maryland Baking Co., Inc., Baltimore, Md.

Filed Aug. 1, 1969, Ser. No. 854,348
Int. Cl. B65b *23/00*
U.S. Cl. 99—180 **6 Claims**



Filler sheets for packaging ice cream cones in cartons are corrugated and folded to provide upstanding panels which support succeeding sheets in alternating relation. Each filler sheet has rows and columns of pockets for holding individual ice cream cones. The sheets are so designed that the upper edges of the upstanding panels lie in a plane above the upper edges of the cones in the pockets.

3,619,217

DESENSITIZER FOR PHOTOLITHOGRAPHIC PRINTING PLATE

Fred William West, Skillman, N.J., assignor to FMC Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 751,363, Aug. 9, 1968, now abandoned. This application Oct. 30, 1968, Ser. No. 772,025
Int. Cl. C09d *5/20*; **C09k** *3/00, 3/18*
U.S. Cl. 106—2 **2 Claims**

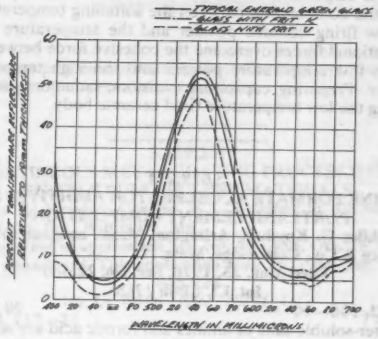
A desensitizer for photolithographic printing plates based on photopolymerizable layers comprises an aqueous acidified lithographic gum in which at least part of the acid is hydrofluoric acid and a minor amount of hydrogen peroxide.

3,619,218

GLASS COLORANT COMPOSITION

Erwin C. Hagedorn, Oregon, and Dallas P. Hall, Toledo, both of Ohio, assignors to Owens-Illinois, Inc.

Division of Ser. No. 579,971, Sept. 16, 1966, which is a continuation-in-part of Ser. No. 285,088, June 3, 1963, abandoned.
Filed Mar. 20, 1970, Ser. No. 21,397
Int. Cl. C03c *3/14, 3/08*
U.S. Cl. 106—47 **4 Claims**



Colorant-enriched frit glass compositions of the following ingredients are disclosed together with methods of producing colored glasses using same:

	Percent by Weight		
Ingredients	Composition 1	Composition 2	Composition 3
SiO_2	15–50	0–10	
Cr_2O_3	2–10	2–10	
R_2O	23–46		
Na_2O	X	21–30	10–40
K_2O	less than 25% X	0–7	
B_2O_3	10.5–47	49–70	35–70
$R_2O + B_2O_3$	44–74		
Fe_2O_3		0–10	
CoO		0–8	0–43 } at least 2%
MnO		0–18	0–23 }
PbO, BaO & ZnO		0–15	
NiO			0–18
Fe_2O_3			0–18
ZnO			0–43
CuO			0–28

3,619,219

NUCLEAR RADIATION ABSORBING GLASS

Heinz Bromer, Hermannstein, near Wetzlar; Norbert Meinert, Wetzlar, and Hans-Jorgen Preuss, Wetzlar, all of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Aug. 27, 1968, Ser. No. 755,550
Claims priority, application Germany, Aug. 29, 1967, L 57316
Int. Cl. C03c *3/30, 3/14*
U.S. Cl. 106—47 R **2 Claims**

In a glass composition containing boric acid as the glass former and further containing the oxides of beryllium and lithium for the purpose of slowing down and moderating nuclear radiation a certain percentage of tungsten oxide is introduced to the effect that the percentage of lithium oxide can then be increased to an amount which in pure $L_2O/BeO/BO_{-3}$-glasses has previously only been achieved with miniature melts of approximately 0.5 grams.

3,619,220

LOW TEMPERATURE FIRED, GLASS BONDED, DIELECTRIC CERAMIC BODY AND METHOD

Galeb H. Maher, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of application Ser. No. 626,245, Mar. 27, 1967, now abandoned. This application Sept. 26, 1968, Ser. No. 767,046

Int. Cl. C04b *33/00*

U.S. Cl. 106—39 R 10 Claims

Combining a high temperature prefired ceramic powder with a low firing temperature ceramic powder; forming a slip or paste suspension of the powder combination, drying and firing the combination between the softening temperature of the low firing ceramic powder and the temperature where gravitational forces overcome the cohesive force between the molten low temperature powder and the high temperature powder. Preparing capacitors, resistors, inductors, etc. employing the low temperature fired ceramic body.

3,619,221

AMINE FORMATE ACCELERATOR ADDITIVES FOR PORTLAND CEMENT COMPOSITIONS

Theophilos G. Kossivas, Arlington, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Mar. 25, 1970, Ser. No. 22,680

Int. Cl. C04b *13/26*

U.S. Cl. 106—90 20 Claims

Water-soluble salts of amines and formic acid are added to Portland cement compositions (e.g. concrete) to accelerate the setting time thereof. The additives exhibit a particular effectiveness for offsetting the set-retardation effect of water-reducing, set-retarding agents, (e.g. lignosulfonates) employed in Portland cement compositions.

3,619,222

MODIFIED PROTEIN COMPOSITION AND METHOD OF FORMING INSOLUBLE SEALS

Ernest E. Werle, Riverside, and Thomas F. Mitchell, Arlington Heights, both of Ill., assignors to Darling & Company, Chicago, Ill.

Filed Feb. 2, 1970, Ser. No. 8,019

Int. Cl. C08h *15/02*

U.S. Cl. 106—123 10 Claims

An adhesive composition having thermosetting and/or thermoplastic properties comprising a protein, such as animal glue, uniformly mixed with a lignosulfonate and polyhydric composition, such as sorbitol, glycerine or ethylene glycol, which can contain water as a carrier, and which on heating forms a water insoluble seal.

3,619,223

PROCESS OF SPINNING VISCOSE

Paul V. Brower, and John F. Fuzek, both of Elizabethton, Tenn., assignors to Beaunit Corporation, New York, N.Y.

Continuation of application Ser. No. 458,018, Sept. 23, 1954, now abandoned. This application June 14, 1965, Ser. No. 463,947

Int. Cl. C08b *21/22*; D01f *3/12, 3/14*

U.S. Cl. 106—165 20 Claims

1. A process for the production of improved cellulosic products which comprises modifying a high maturity viscose by incorporating therein at least about 0.15 percent by weight of a polyalkylene glycol having an average molecular weight of about 300 to 7,500 and extruding while stretching the resultant viscose at a salt point of about 7.5 to 9 into an acid spin bath comprising sulfuric acid, sodium sulfate and at least 4 percent by weight of zinc sulfate, said percentage of said polyalkylene glycol being based upon the cellulose content of the viscose, and said amount of said polyalkylene glycol being sufficient to produce a regenerated cellulosic product having substantially increased dry strength over that obtained without said polyalkylene glycol, said dry strength being at least about 3.83 grams per denier.

3,619,224

HOT MELT ROAD-MARKING COMPOSITIONS

Wataru Inamoto, Sakai-shi; Seizo Kuroki, Osaka-shi; Kohtaro Tottori, Sakai-shi; Osamu Nagasawa, Sakai-shi, all of Japan, and Sakai Chemical Industry Company Limited, Sakai-shi, Osaka-fu, Japan

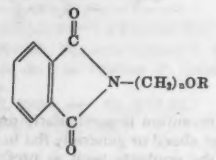
Filed July 22, 1969, Ser. No. 843,756

Claims priority, application Japan, July 24, 1968, 43/52707

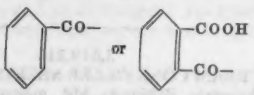
Int. Cl. C08h *17/44*

U.S. Cl. 106—240 9 Claims

A hot melt road-marking composition which comprises 15 to 40 weight percent of a thermoplastic binder resin having a softening point of 50° to 160° C., 10 to 30 weight percent of at least one species of phthalimide derivatives having the structural formula of



wherein R is hydrogen, CH_3CO—,



and *n*

is an integer of 1 or 2, and 30 to 75 weight percent of filler and pigment; said phthalimide derivative having a melting point of 90° to 120° C. and capable of dissolving said thermoplastic resin binder therein when fused but having substantially no compatibility with the resin binder at a room temperature.

3,619,225

LOW ADHESION SURFACE COATINGS COMPRISING IMIDES OR AMIDES OF FLUORENE SUCCINIC ACID (9)

Hans-Werner Demmig, and Kurt Rehnelt, both of Dusseldorf, Germany, assignors to Henkel & Cie., G.m.b.H., Dusseldorf-Halthausen, Germany

Continuation-in-part of application Ser. No. 712,380, Mar. 12, 1968, now Patent No. 3,538,054. This application Feb. 20, 1970, Ser. No. 13,169

Claims priority, application Germany, Mar. 15, 1967, H 62,138

Int. Cl. C07g *17/00*

U.S. Cl. 106—287 5 Claims

Compositions for forming low adhesion surface coatings on cellulose-containing materials wherein the main coating agent is an imide or amide of fluorene succinic acid-(9) substituted on the nitrogen with aliphatic or cycloaliphatic radicals of five to 22 carbon atoms and the coated cellulose containing materials which are useful in pressure-sensitive adhesive tapes.

3,619,226

FLUID, NONCRYSTALLINE CHLOROPRENE COPOLYMERS

Chester Arthur Hargreaves, II, and Franklin Luckenbill Montgomery, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 16, 1967, Ser. No. 646,497

Int. Cl. C08h *17/26*

U.S. Cl. 106—287 2 Claims

The present invention is directed to a novel copolymer of (1) chloroprene monomer and (2) a copolymerizable monomer, said copolymer being prepared by polymerizing an aqueous emulsion of said monomers to 90 to 100 percent monomer conversion in the presence of from about 0.2 to about 0.6 parts of sulfur and an amount of a dialkyl xanthogen disulfide equivalent to about 4 to about 15 parts diethyl xanthogen disulfide; parts are by weight per 100 parts of total monomers.

3,619,227
IRON OXIDE PIGMENTS
Frederick Roy Tomkinson, Saddleworth, near Oldham, England, assignor to Pfizer Inc., New York, N.Y.
Filed July 15, 1968, Ser. No. 744,703
Claims priority, application Great Britain, July 21, 1967, 33,607/67
Int. Cl. C09c *1/24*
U.S. Cl. 106—304 12 Claims

Coloring matter deposited on iron oxide particles obtained by precipitation, produces stable light-fast pigments with enhanced tinctorial value. These composite pigments, which have a greatly diminished tendency to separate into their component colors, are useful in coloring concrete, bricks, plastics, textiles and paints.

3,619,228
METHOD OF PATCHING WOOD PRODUCTS USING A PARTICULAR POLYESTER BLEND
Earland G. Hallonquist, Nanaimo, British Columbia, and Manfred M. Honnige, Ceder, British Columbia, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada
Filed July 25, 1966, Ser. No. 567,359
Int. Cl. B32b *35/00*; C08b *27/18, 27/04*
U.S. Cl. 117—2 4 Claims

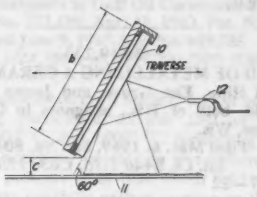
An improved plywood patch is obtained by a method of patching plywood comprising the steps of preparing a blend of (A) 45 to 72 weight percent of a mixture containing (1) a polymerizable linear polyester resin comprising reactants of (a) a polyhydric alcohol, (b) an adduct of hexahalocyclopentadiene and an ethylenically unsaturated polycarboxylic compound and (c) a compound selected from the group consisting of maleic anhydride and fumaric acid and (2) an ethylenically unsaturated monomer, (B) 0–10 weight percent of a modifying monomer selected from the group consisting of styrene, vinyl toluene, vinylacetate and α-methyl styrene and (C) 28 to 45 weight percent of an inert material selected from the group consisting of clay, whiting, asbestos, shell flour and wood flour, mixing a catalyst with said blend, applying the catalyzed blend to defects in a plywood surface and curing the blend for at least 10 minutes at a temperature of about 200° to 235° F.

3,619,229
REINFORCED POLYSTYRENE AND ITS COPOLYMERS
Robert C. Hartlein, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Sept. 5, 1968, Ser. No. 757,749
Int. Cl. C03c *25/02*
U.S. Cl. 117—4 10 Claims

Polystyrene and copolymers thereof can be reinforced by glass fibers having a coating of silane coupling agent and a thermosetting polymer such as epoxy, phenolic, polyester, polyacrylate and melamine, to provide superior thermoplastic injection molding compositions.

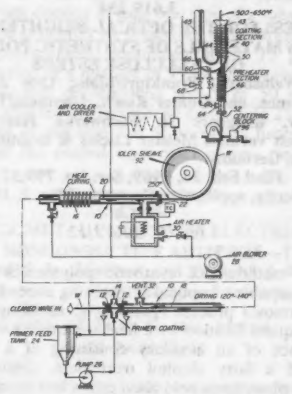
3,619,230
PARTICULATE COATING METHOD
Carl Matthews, London, England, assignor to Matthews Refractories Limited, London, England
Continuation-in-part of application Ser. No. 580,716, Sept. 26, 1966, now abandoned. This application Mar. 23, 1970, Ser. No. 21,979
Claims priority, application Great Britain, Sept. 20, 1965, July 25, 1966; 40,037/65, 33,288/66
Int. Cl. B44c *1/06*; B44f *9/04*
U.S. Cl. 117—19 9 Claims

A method of producing a coated surface comprises the steps of grinding a natural stone to particle sizes of less than 1 mm., adjusting the proportions of particle sizes present to produce a mixture containing 20 to 30 percent by weight of particles of size less than 100 mu, applying at least one adhesive layer to the surface, depositing onto the adhesive layer to be secured thereby a layer of the said particle mixture to produce a substantially continuous adherent surface layer of



contiguous particles obscuring the adhesive from view, and removing surplus nonadherent particles.

3,619,231
CONTINUOUS METAL COATING PROCESS WITH FUSIBLE PULVERULENT MATERIALS
William B. Johnson, Chester, N.J., assignor to Anchor Post Products, Inc., Baltimore, Md.
Continuation of application Ser. No. 496,458, Oct. 15, 1965, now abandoned. This application June 16, 1969, Ser. No. 845,926
Int. Cl. B44d *1/092, 1/094, 1/42*
U.S. Cl. 117—21 7 Claims



A method and apparatus for the coating of running strands on webs with a thermoplastic protective layer. The successive steps comprise the application of a primer and the air current drying and curing of same using inductive heating. While still hot, the strand or web is passed axially through a dense cylindrical bed of a powdered thermoplastic. This bed is constantly being cooled and replenished by recycling using air currents and directional jets. Vinyl polymer, epoxy-polyamide, and polyolefins such as polyethylene or polypropylene containing metals, metal oxides, metal hydroxides and metal carboxyl groups are proposed as coating materials.

3,619,232
METHOD OF FORMING A PINHOLE-FREE ALLOY LAYER ON THE SURFACE OF A BASE MADE OF ALUMINUM OR AN ALUMINUM ALLOY
Tadashi Nakano, 2-15-4, Kasumigaoka, and Keiichi Henmi, 1-12-9, Haruyoshi, both of Fukuoka, Japan
Filed Mar. 29, 1968, Ser. No. 717,333
Int. Cl. C23c *17/02*
U.S. Cl. 117—22 4 Claims

A method of forming a pinhole-free alloy layer on the surface of a base made of aluminum or an aluminum alloy, said method being characterized by applying a thin film of

hydrocarbon on the surface of the base, spraying and depositing fine particles of a metal halide over said film, heating the coated base in a furnace to over the temperature at which a sublimation of aluminum halide takes place and then cooling it.

3,619,233

METHOD OF METALLIZING A CERAMIC MEMBER

Julius Carl Hipp, Elm Grove, and James Arthur Schmidt, Brookfield, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 6, 1969, Ser. No. 804,987
Int. Cl. B44d 1/16; C03c 17/08
U.S. Cl. 117—22 11 Claims

A thick, solderable metallic coating is provided on a ceramic member by applying a metallic composition comprised of at least 10 weight percent, preferably at least 30 weight percent, of powdered molybdenum trioxide, or tungsten trioxide, or mixtures thereof, and at least 30 weight percent of powdered gold, or copper, or silver, or alloys thereof, on the surface of the member and then firing the coated member in a wet reducing atmosphere at a temperature above the melting point of the solderable material to substantially reduce the molybdenum trioxide and/or tungsten trioxide to the metallic form. In one embodiment, the molybdenum trioxide and/or tungsten trioxide is applied to the surface of the ceramic member first and gold, copper, silver, or alloys thereof, is then applied over this first coating. In another embodiment, the metallic composition is applied to the ceramic member as an admixture.

3,619,234

PROCESS FOR THE OPTICAL BRIGHTENING OF FIBROUS MATERIALS OF SYNTHETIC POLYAMIDES OR CELLULOSE ESTERS

Joachim Weihsbach, Frankfurt/Main; Otto Smerz, Kelkheim/Taunus, and Gunter Rosch, Altenhain/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Feb. 14, 1969, Ser. No. 799,531
Claims priority, application Germany, Mar. 2, 1968, P 17 19 355.4
Int. Cl. D06l 3/12
U.S. Cl. 117—33.5 T 8 Claims

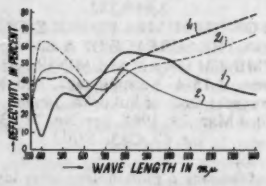
Fibrous materials of synthetic polyamides or cellulose esters are capable of optical brightening according to the so-called thermosol process (padding at ambient temperature with subsequent fixation by a heat treatment) when fixing in the presence of an auxiliary consisting of a polyalkylene glycol and a fatty alcohol oxethylate. Optionally foam-depressing phosphoric acid alkyl esters and branched carboxylic acid esters are used additionally.

3,619,235

INFRARED REFLECTING GLASS AND METHOD FOR THE MANUFACTURE THEREOF

Shigemasa Furuuchi, and Takashi Mukaiyama, both of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Continuation of application Ser. No. 551,566, May 20, 1966, now abandoned. This application Oct. 6, 1969, Ser. No. 866,100
Claims priority, application Japan, May 24, 1965, 40/30164
Int. Cl. C03c 17/06
U.S. Cl. 117—33.3 5 Claims



An infrared reflecting layer is deposited on a surface of a glass sheet by thermal decomposition. The deposited layer is one or more oxides of Ti, Ta, W, Zr, Th, Sn or Nb containing uniformly dispersed microscopically fine particles of metallic gold and/or metallic platinum. The film is mechanically strong and chemically stable.

3,619,236

METHOD FOR COATING LAYERS OF GELATIN AND A CARBOXYL-CONTAINING POLYMER ON A SUPPORT

Glen M. Dappen, and Grace E. Kane, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1968, Ser. No. 778,843
Int. Cl. G03c 1/30
U.S. Cl. 117—34 7 Claims

A hardened coating such as a photographic emulsion, containing gelatin and a water soluble carboxyl-containing polymer, is provided on a support by first blending the gelatin with a carbodiimide or isoxazolium slat hardener and subsequently blending that mixture with the carboxyl-containing polymer to provide a coating material which hardens sufficiently slowly to provide uniform coating.

3,619,237

COPY SHEET UTILIZING CERTAIN ACETOACETONITRILES

Albert W. Leclair, Hudson, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Mar. 10, 1969, Ser. No. 805,839
Int. Cl. B41m 5/22
U.S. Cl. 117—36.2 4 Claims

A thermographic copy sheet capable of being rendered thermographically inactive upon exposure to short wave length radiation is formed from acetoacetonitrile derivatives such as 2-phenyl acetoacetonitrile, and a material reactive with it to form a color, such as a silver slat. A dye sensitizer may be included to shift the spectral response.

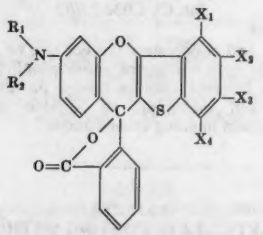
3,619,238

PRESSURE SENSITIVE COPYING PAPER

Shiro Kimura; Teruo Kobayashi, and Sadao Ishige, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 15, 1969, Ser. No. 841,991
Claims priority, application Japan, July 15, 1968, 43/49816
Int. Cl. B41m 5/22
U.S. Cl. 117—36.2 2 Claims

A pressure sensitive copying paper is prepared using a color former of the general formula



wherein R_1 and R_2 each represents an alkyl group having 1 to 5 carbon atoms or a benzyl group, and X_1, X_2, X_3 and X_4 each represents a hydrogen atom, a halogen atom, an alkoxyl group or a methyl group. The compound of the above general formula is incapsulated in solution and the thus formed microcapsules are applied to an upper paper. When this upper paper is superimposed over a lower paper coated with an electron acceptable solid acid such as an acid clay, in such a manner that the microcapsule coated surface is in direct contact with the acid coated surface, and pressure applied thereto, a deep reddish purple color is formed in those areas to which pressure has been applied. The color former

of the above general formula may also be admixed with yellow orange, or blue color formers to produce black images.

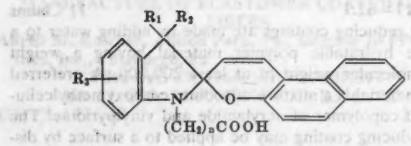
3,619,239

PRESSURE SENSITIVE COPYING PAPER

Chiaki Osada, and Hisatake Ono, both of Asaka-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1969, Ser. No. 884,006
Claims priority, application Japan, Dec. 10, 1968, 43/90351
Int. Cl. B41m 5/22
U.S. Cl. 117—36.2 4 Claims

A novel color forming material used in a pressure sensitive copying paper comprises



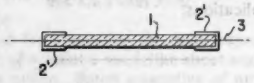
wherein n is an integer of 1 to 4; R_1 and R_2 represent an alkyl group having 1 to 4 carbon atoms or a phenyl group; R_3 represents a hydrogen atom, an alkoxyl group wherein the alkyl group is an alkyl group having 1 to 4 carbon atoms, an alkoxycarbonyl group wherein the alkyl group is an alkyl group having 1 to 4 carbon atoms or a halogen atom.

3,619,240

MECHANICALLY STRENGTHENING ARTICLES MADE OF VITREOUS OR CERAMIC MATERIALS

Francois Toussaint, Lodelinsart, and Maurice Boffe, Fleurus, both of Belgium, assignors to Glaverbel S. A., Watermael-Boitsfort, Belgium

Filed Apr. 18, 1968, Ser. No. 722,381
Claims priority, application Luxembourg, Apr. 25, 1967, 53,509
Int. Cl. C03c 17/00
U.S. Cl. 117—40 25 Claims



Processes for increasing the mechanical strength of articles made of glass, vitrocrystalline materials or ceramic materials by coating at least certain surface portions of a base layer with a coating of glass substance having a lower softening temperature and a lower coefficient of thermal expansion than the material of the base layer, the coating material being brought to a temperature which is sufficiently high to place it in at least a softened state and the resulting unit then being cooled to produce compressive stresses in the layer of coating material. Articles composed of a base layer and a coating layer having a lower coefficient of thermal expansion and a lower softening temperature than the base layer, the coating layer having been placed in a softened condition either before or after having been applied to the base layer.

3,619,241

PROCESS FOR MAKING PYROLYTIC CARBON COATED NUCLEAR FUEL OR POISON

Walter V. Goedell, Poway, and Charles S. Luby, San Diego, both of Calif., assignors to Gulf Oil Corporation

Division of Ser. No. 272,199, Apr. 11, 1963, Pat. No. 3,325,363.
Filed June 9, 1967, Ser. No. 649,785
Int. Cl. B41m 5/24, B44c 1/097, C23c 7/00; 9/06; 13/02
U.S. Cl. 117—46 6 Claims

A method of manufacturing a nuclear fuel or poison which includes heating particulate nuclear fuel or poison to between about 800° C. and 1400° C., contacting the heated material with an acetylene containing atmosphere having an acetylene partial pressure of at least about 0.65 atmosphere to deposit a spongy pyrolytic carbon coating on the particles followed by depositing a dense exterior fission products retentive coating on the spongy carbon coating.

3,619,242

METHOD FOR TREATING THE SURFACE OF A SUBSTRATE SHEET

Masao Ogawa, Tokyo; Shigeo Hayashi, Yokohama-shi; Wasuke Sato, Kawasaki-shi; Ichiro Morimoto, Kawasaki-shi; Teisuke Horibe, Tokyo, and Gunji Takeuchi, Yokohama-shi, all of Japan, assignors to Shawa Denko K. K., Tokyo, Japan

Filed Dec. 23, 1968, Ser. No. 786,466
Claims priority, application Japan, Feb. 1, 1968, 43/6137
Int. Cl. B44d 1/50, 1/097
U.S. Cl. 117—46 FC 6 Claims

A method for treating the surface of a substrate sheet which comprises coating at least one side of a substrate sheet with a solution prepared by dissolving in an organic solvent chlorinated polyethylene containing 40 to 75 percent by weight of chlorine or a mixture of 99 to 50 percent by weight of said chlorinated polyethylene and 1 to 50 percent by weight of chlorinated polypropylene containing 25 to 35 percent by weight of chlorine and, if necessary further treating the surface of the coated layer with corona discharges or flames.

3,619,243

NO RERACK METAL PLATING OF ELECTRICALLY NONCONDUCTIVE ARTICLES

Frank A. Brindisi, Jr., Madison, and Theophil J. Wieczorek, West Haven, both of Conn., assignors to Enthone Incorporated, New Haven, Conn.

Filed Feb. 17, 1970, Ser. No. 12,134
Int. Cl. B44d 1/092
U.S. Cl. 117—47 A 23 Claims

No rerack process for the metal plating of electrically nonconductive articles or objects on vinyl plastisol-coated plating racks, involving contacting the rack prior to racking thereon the nonconductive articles destined to be plated with a liquid lower alkyl formamide, preferably N,N-dimethylformamide, or N-methyl-2-pyrrolidone, or a mixture thereof, for a time sufficient to render the rack substantially nonsusceptible to electroless deposition of metal thereon during a subsequent electroless metal plating step. Consequently the prior requirement of reracking of the articles on clean racks subsequent the electroless metal plating step and prior to the electroplating is eliminated.

3,619,244

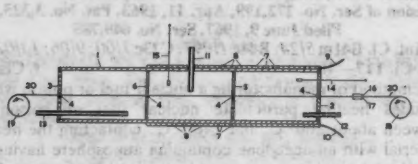
PRODUCTION OF TREATED MATERIALS

Robert Holroyd Stanley, Shincliffe Village; George Harry James Neville, Darlington, and Frank Pickering, Billingham, all of England, assignors to British Titan Products Company Limited, Durham, England

Filed Mar. 20, 1968, Ser. No. 714,620
Claims priority, application Great Britain, Apr. 18, 1967, 17709/67
Int. Cl. B44d 1/092, 5/06
U.S. Cl. 117—47 A 30 Claims

A process for the production of iridescence on synthetic polymeric surfaces by applying to the surface as a film of

variable thickness adequate to produce iridescence within the visible spectrum a titanium compound having the general formula Ti(X)$_4$ in which X represents a halogen atom or a (–OR) group and subsequent to application of the film age-



ing the treated surface at a temperature above 85° C. The titanium compound is preferably titanium tetrachloride although organic titanates are also useful and the synthetic polymeric surface is preferably a surface formed of polyethylene terephthalate.

3,619,245

PRELIMINARY TREATMENT FOR POLYOLEFINS TO BE CHEMICALLY METAL PLATED

Hiroshi Maekawa, Sakai-shi, Japan, assignor to Okuno Chemical Industry Company, Limited, Osaka-shi, Japan

Filed July 9, 1968, Ser. No. 743,283

Claims priority, application Japan, July 13, 1967, 42/45448

Int. Cl. B44d *1/092*; **C23c** *3/02*

U.S. Cl. 117—47 A **9 Claims**

In chemically plating a polyolefin resin, a process which comprises wetting a surface of a polyolefin resin to be etched for chemical plating with an organic solvent solution of an organic peroxide having a concentration of 10 to 90 weight percent, and then decomposing the organic peroxide on the surface of the polyolefin resin.

3,619,246

TREATMENT OF RESIN SURFACES TO IMPROVE THEIR RECEPTIVITY TO COATINGS AND THE LIKE AND RESIN BODIES WITH TREATED SURFACES

Robert A. Bragole, West Peabody, Mass., assignor to USM Corporation, Boston, Mass.

Filed May 12, 1969, Ser. No. 823,964

U.S. Cl. 117—47 A **9 Claims**

Resin materials having low-surface energy are treated to increase their surface receptivity towards coatings and the like by providing a photosensitizer at the surface of the resin, subjecting the surface to ultraviolet radiation and applying a silane or siloxane to the surface prior to coating.

3,619,247

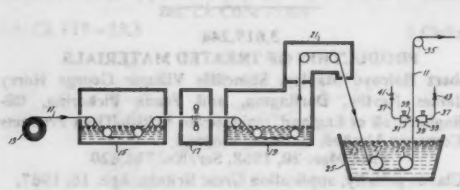
METHOD OF PRODUCING THIN, BRIGHT UNSPANGLED GALVANIZED COATINGS ON FERROUS METAL STRIPS

Perry Marvin Newport, and George Michael Mino, both of Hamburg, N.Y., assignors to Bethlehem Steel Corporation

Filed Aug. 29, 1968, Ser. No. 756,283

Int. Cl. B05c *11/06*; **C23c** *1/02*

U.S. Cl. 117—51 **2 Claims**



A very light gage flat hot dip galvanized strip having a bright unspangled surface, is made by applying a very thin zinc coating to smooth cold strip having a surface finish between 20 and 80 microinches by passing the strip at a high rate of speed through a low temperature molten zinc bath having a high aluminum content and wiping the strip quickly by means of powerful steam wiper dies located closely adjacent to both the strip and bath surfaces.

3,619,248

FRICTION REDUCING COATINGS

Norman F. Whitsitt, Plano; Walter D. Garland, Carrollton; James K. Baxter, Richardson, and William G. Setser, Richardson, all of Tex., assignors to The Western Company of North America

Filed July 15, 1968, Ser. No. 744,652

Int. Cl. B44d *1/44*

U.S. Cl. 117—62.1 **11 Claims**

Friction reducing coatings are made by adding water to a particulate hydratable polymer material having a weight average molecular weight of at least 200,000. A preferred polymer material is a mixture of sodium carboxymethylcellulose and a copolymer of acrylamide and vinylpyridine. The friction reducing coating may be applied to a surface by distributing the particulate polymer material over the surface to form a thin layer which is then wet with water or by applying a water solution of the polymer material to the surface, or by applying a slurry of the polymer material over the surface and wetting the film formed by evaporation from the slurry. The slurry of polymer material may comprise a mixture of hydratable polymer material, a gelling agent, a dispensing agent such as methanol, and a plasticizer, such as glycerol. After applying the slurry to the surface, water is added when the alcohol suspending agent has evaporated.

3,619,249

A METHOD FOR PRODUCING A FLUOROCARBON COATING ON METALS AND CERAMICS AND THE PRODUCT THEREOF

William A. Cannon, Garden Grove, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Aug. 5, 1968, Ser. No. 749,944

Int. Cl. B44d *1/48*, *1/36*

U.S. Cl. 117—62.1 **12 Claims**

Fluorocarbon coated metals and ceramics and method therefor. The metal or ceramic substrate is treated with a polar organic material to effect chemisorption of a monomolecular layer. A viscous saturated hydrocarbon coating, e.g., of petrolatum, is applied over the chemisorbed layer and is fluorinated to convert the hydrocarbon to the corresponding fluorocarbon. Such fluorocarbon coated metals and ceramics are useful for antisticking, anticorrosion and antifriction applications.

3,619,250

METHOD FOR MAKING MICROPOROUS SHEET MATERIAL

Yasushi Nishijima, Sakai, Japan, assignor to Kanegafuchi Boseki Kabushiki Kaisha

Filed June 23, 1969, Ser. No. 835,766

Claims priority, application Japan, July 18, 1968, 43/51063

Int. Cl. B44d *1/44*; **D06n** *3/04*

U.S. Cl. 117—63 **5 Claims**

A method of making a microporous sheet material is disclosed. A base material is coated with a solution of a film-forming synthetic polymer. The solution consists mainly of polyurethane dissolved in a water-miscible organic solvent. The coated base material is treated with a coagulating liquid containing urea and at least one water-soluble inorganic salt. The coagulated polymer layer is then washed and dried.

3,619,251

CLEANING AND POLISHING CLOTH AND METHOD OF MAKING IT

Norman S. Stiles, Sr., 2069 Meadow View Road, Westfield, N.J.

Filed May 22, 1969, Ser. No. 834,191
Int. Cl. A47l *13/00*; B44d *1/092*
U.S. Cl. 117—56 4 Claims

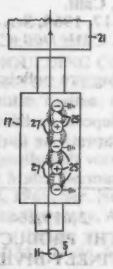
A cleaning and polishing cloth consists of a cotton fabric impregnated with mineral spirits. It is made by washing and drying a piece of cotton material, immersing it into a bath of mineral spirits, then wringing it and then allowing it to dry for a period of about 5 to 7 days. The finished cloth may be sprayed with perfume, if desired. It can be used most effectively for cleaning and polishing all types of articles, as well as a floor mop and a blackboard wiper.

3,619,252

MANUFACTURE OF ELASTOMER COATED GLASS FIBERS

Alfred M. Roscher, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1966, Ser. No. 605,814
Int. Cl. C03c *25/02*; B44d *1/50*; B32b *17/04*
U.S. Cl. 117—66 23 Claims



This invention relates to coating and impregnating glass fibers with an aqueous elastomer composition and then drying the glass fibers with high frequency electrical heating to move substantially all the water while leaving the elastomer solids substantially unaffected. Also encompassed herein are products produced by the foregoing process, as well as the subsequent process step of applying additional heat to cure a heat curable resin component of the coating and impregnating composition.

3,619,253

COLOR CONTROL FOR SUEDELIKE POLYMERIC SHEET MATERIALS

Charles L. Hoffmeyer, Madison, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1968, Ser. No. 788,006
Int. Cl. D06n *3/00*
U.S. Cl. 117—66 10 Claims

A new method for improving the color reproducibility of batch quantities of synthetic suedelike sheet materials is provided by this invention. Batch quantities of newly prepared sheet material, are color corrected to substantially match specific color standards by adjusting the solids content of a fluorochemical and polyorganosiloxane repellency solution between 0.5 and 10 percent solids prior to applying the repellency solution to the sheet material.

3,619,254

THERMOMETRIC ARTICLES AND METHODS FOR PREPARING SAME

Frederick Davis, Pittsburgh, Pa., assignor to Liquid Crystal Industries, Turtle Creek, Pa.

Filed Mar. 18, 1969, Ser. No. 808,319
Int. Cl. B44d *1/14*; G01k *11/16*
U.S. Cl. 117—72 15 Claims

Thermometric articles comprising a substrate, a coating of a cholesteric composition on the substrate, and a coating of a solid on the cholesteric composition, the solid being immiscible and unreactive with the cholesteric composition; and methods for preparing such articles.

3,619,255

SUBSTRATE COATED WITH AN ORGANOPOLYSILOXANE EMPLOYING A PRIMER COMPRISING A TITANATE AND AN ORGANOPOLYSILICATE

Guenther Fritz Lengnick, Mantiou Beach, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

Continuation-in-part of application Ser. No. 661,544, Aug. 18, 1967, now abandoned. This application Nov. 10, 1969, Ser. No. 875,485
Int. Cl. B32b *15/08*, *17/10*, *27/08*
U.S. Cl. 117—75 5 Claims

This invention relates to a primer composition comprising a solution of organosilicates and condensed titanates of the formula $(Ti)_n(O)_m(OR)_p$, wherein R is an organic radical having from one to 20 carbon atoms, n is an integer of at least 2, m is an integer of at least 1 and p is an integer of at least 4 and use of the primer composition to adhere silicone rubber to substrates.

3,619,256

SILICONE RUBBER COATED SUBSTRATES AND A METHOD FOR BONDING SILICONE RUBBER THERETO

Anthony Enrico Pepe, Sylvania, Ohio, and Charles George Neuroth, Blissfield, Mich., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 780,255
Int. Cl. B44d *1/14*; B32b *15/08*, *25/20*
U.S. Cl. 117—75 9 Claims

A silicone rubber coated substrate and method for preparing the same which comprises treating a substrate with a primer solution containing an ω-amino-organosilane and thereafter coating the primed substrate with a room-temperature-curable organopolysiloxane composition containing a silane compound having both an oxirane ring and a hydrolyzable group on the silane molecule. The silane compound will react with the primer composition and also act as a curing agent for the organopolysiloxane composition to provide an adhesive bond between the silicone rubber and the substrate.

3,619,257

PREPARATION OF PLURAL LAYER SYNTHETIC LEATHER AND THE LIKE

Kazuo Fukada, Hyogo; Hiroshi Okamoto, Osaka, and Hiroaki Tanaka, Osaka, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed July 30, 1968, Ser. No. 748,597
Claims priority, application Japan, Aug. 8, 1967, 42/51319
Int. Cl. B44d *1/14*; D06n *3/08*
U.S. Cl. 117—76 T 15 Claims

A process for producing a plural-layer synthetic leather whereby (1) a fibrous material is impregnated with a polyurethane containing polymer solution, treated with a nonsolvent for the polymer which nonsolvent is miscible with the solvent of the polymer solution which acts to coagulate the polymer so as to form a porous structure, (2) treating the treated base with an aqueous solution of a solvent or a surfactant and (3) coating the polymer solution onto the pretreated fibrous base and coagulating the polymer with a nonsolvent so as to form a porous structure.

3,619,258

PLASTICIZED SULFUR, COATED ASPHALT IMPREGNATED FABRIC

Richard J. Bennett, and Rector P. Louthan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Apr. 10, 1968, Ser. No. 720,368
Int. Cl. B32b *11/04*
U.S. Cl. 117—92 6 Claims

A fabric is asphalt or bitumen coated and then adhesively coated at least on one side with plasticized sulfur. Bitumens including asphalt and asphalt emulsions now available are applicable. Hot melt application which can be followed im-

mediately by the plasticized sulfur is possible. The product, which is flexible, solvent, weather resistant and light reflecting, and can be used for waterproofing as in roofing, road liners, pond and ditch liners, as wrapping material, it can be packaged as in rolls for marking stripes on tennis courts, athletic fields. Also, it can be used as pipe wrap, tank cladding and for decorative purposes.

3,619,259

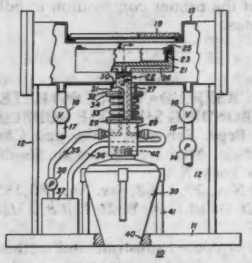
PHOTOPOLYMERIZED FILM, COMPOSITE THEREOF, AND METHOD OF FORMING

Archibald N. Wright, and Wilfred F. Mathewson, Jr., both of Schenectady, N.Y., assignors to General Electric Company

Continuation-in-part of application Ser. No. 628,447, Apr. 4, 1967. This application Apr. 1, 1969, Ser. No. 812,262

Int. Cl. B44d *1/50*

U.S. Cl. 117—93.31 **11 Claims**



A thin, continuous film is formed on a substrate by the ultraviolet surface polymerization of the vapor of an imide containing photopolymerizable organic material. Such films are useful as coatings on metallic and nonmetallic substrates, capacitor dielectrics, cryogenic device insulation, insulation for microelectric devices, insulation on electrically conductive wire, and for corrosion protection.

3,619,260

POLYMERIZATION OF BIS-(ACRYLOXYALKYL) CARBONATES

Gordon M. Parker, Harwick, Pa., assignor to PPG Industries, Inc, Pittsburgh, Pa.

Filed June 2, 1969, Ser. No. 829,753

Int. Cl. C08f *1/16;* **C07c** *69/54*

U.S. Cl. 117—93.31 **4 Claims**

Phosgene is reacted with acrylates or methacrylates containing one hydroxyl group in the presence of an acid acceptor to form the novel bis-(acryloxyalkyl) carbonates of this invention. The product is highly radiation sensitive so that it may be polymerized by ionizing radiation and forms a coating which is hard and stain resistant.

3,619,261

COATING FOR FIBERBOARD AND CONTAINERS FORMED THEREFROM

Harry E. Dunholter, 4851 S. Arvilla Drive, Toledo, Ohio, and James C. Jones, 3304 River Road, Toledo, Ohio

Filed Jan. 30, 1970, Ser. No. 7,243

Int. Cl. B44d *5/08, 5/00*

U.S. Cl. 117—95 **11 Claims**

Free release coating for fiberboard surfaces by applying to the surface the reaction product of fatty acids and diethanolamine. This coating is made by heating the reaction product of a fatty acid and diethanolamine in the presence of a diluent of an alkyl glycol at a sufficient temperature and for a suitable time until a uniform mixture is obtained. The mixture is applied to a fiberboard surface of a container without any post curing to provide a coating which will freely release camelback rubber upon storage in the container.

3,619,262

PROCESS FOR DEPOSITING CARBON ON IRON

Marneil A. Segura, Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed Jan. 16, 1970, Ser. No. 3,497

Int. Cl. C23f *9/02;* **B44d** *1/12*

U.S. Cl. 117—100 M **11 Claims**

A process for coating a metal surface, such as a reduced iron ore, with an adherent layer of carbon is provided. The metal is contacted with carbon and a mixture of olefins. Suitably, the olefin mixture contains polyenes and dienes, preferably cyclopolyenes and cyclodienes. The process is conducted at temperatures ranging from about 200° F. to about 600° F. The metal surface, coke, and the olefinic mixture is brought into contact by any solid-liquid contact means, e.g., by spraying a slurry of carbon and olefin mixture in a fluidized bed of the metal or by slurrying the reactants in a solid blender. The concentration of reactants, the bath temperature and the contact time generally will control the amount of carbon that is deposited on the metal surface.

3,619,263

COATING OF ORE PELLETS WITH BITUMINOUS EMULSIONS

Edward R. Bremer, St. Paul, Minn., and Robert M. Ripple, San Francisco, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1968, Ser. No. 784,482

Int. Cl. C21b *1/00;* **C22b** *1/00*

U.S. Cl. 117—100 B **6 Claims**

Process for protecting ore pellets from abrasive degradation by coating them with a bituminous emulsion in an amount sufficient to deposit on the pellet surfaces from 0.1 to 0.3 percent by weight relative to the pellets of a protective coating.

3,619,264

PROCESS FOR THE PRODUCTION OF WATER-REPELLENT, FINELY-DIVIDED INORGANIC COMPOUNDS

Karl-Heinz Worms, Dusseldorf-Holthausen, and Stefan Gjavotchanoff, Monheim-Hitdorf, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Dec. 26, 1968, Ser. No. 787,199

Claims priority, application Germany, Dec. 28, 1967, H 64 896

Int. Cl. B44d *1/02;* **C08h** *9/00*

U.S. Cl. 117—100 **4 Claims**

A process for imparting water-repellent properties to an inorganic compound which comprises treating said inorganic compound in a finely-divided form with from 1 to 20 percent by weight, based on the weight of said inorganic compound, of a compound having the formula

R–COOR′

wherein R is the aliphatic remainder of a fatty acid having 10 to 26 carbon atoms and R′ is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms at a temperature of from 150° C. to 350° C., and recovering a water-repellent inorganic compound.

3,619,265

RARE EARTH OXIDE HAVING INERT LAYER THEREON AND METHOD OF MAKING SAME

Michael J. Hammond, and Raymond F. Herner, both of Iowanda, Pa., assignors to GTE Sylvania Incorporated

Filed Feb. 28, 1969, Ser. No. 803,429

Int. Cl. C09k *1/04*

U.S. Cl. 117—100 B **5 Claims**

A rare earth oxide host phosphor has incorporated thereon an outer layer of chemically combined fluoride ion. The coating increases the adherence properties of the phosphor in slurry application techniques for the manufacture of television screens by preventing poisoning of the phosphor particles by dichromate ions present in the slurry. The phosphor is coated by batching in a .05 molar fluoride bath, in acidic

solution, about 400 to 500 grams of phosphor per liter of solution, agitating for about 20 to 30 minutes, and decanting the acidic solution, washing and then filtering and drying the phosphor. The drying temperature should be less than 200° C. to prevent disruption of the coating.

3,619,266

THERMOPLASTIC MOULDING COMPOSITIONS ON THE BASIS OF SATURATED POLYESTERS

Klaus Weissermel, Kelkheim/Taunus; Rudolf Kern, Mainz; Heinz Schmidt, Frankfurt am Main, and Walter Herwig, Frankfurt am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 18, 1969, Ser. No. 817,550

Claims priority, application Germany, Dec. 12, 1968, P 18 14 148.5

Int. Cl. B32b *27/06, 27/36*

U.S. Cl. 117—100 C **15 Claims**

Thermoplastic moulding compositions on the basis of linear saturated polyesters wherein the polyester granules containing a neutral or partially neutralized salt of montan wax or of montan wax esters is additionally coated with a neutral or partially neutralized salt of montan wax or of montan wax esters.

3,619,267

THERMOPLASTIC MOULDING COMPOSITIONS ON THE BASIS OF SATURATED POLYESTERS

Klaus Weissermel, Kelkhein/Taunus; Rudolf Kern, Mainz; Walter Herwig, Frankfurt am Main, and Siegfried Breitschaft, Augsburg, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 18, 1969, Ser. No. 817,570

Claims priority, application Germany, Apr. 12, 1968, P 18 14 149.6

Int. Cl. B32b *27/06, 27/36*

U.S. Cl. 117—100 C **10 Claims**

Thermoplastic moulding compositions on the basis of saturated linear polyesters which comprises coating the polyester granules with neutralized or partially neutralized slats of montan wax or of esters of montan wax.

3,619,268

LAMINATED ARTICLES COMPRISING A THERMOPLASTIC CORE AND A HIGH DENSITY RIGID POLYURETHANE FOAM COATING

Earl J. Robertson, Grosse Ile, and Robert M. Rodak, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 24, 1969, Ser. No. 801,738

Int. Cl. B44d *1/22*

U.S. Cl. 117—104 R **7 Claims**

High density rigid polyurethane foams are employed as coatings for thermoplastic polymers. The resulting laminated articles are useful insulative articles such as beverage coolers, building articles such as building panels and buoyant articles such as sailboats.

3,619,269

SURFACE MODIFYING TREATMENT OF SHAPED ARTICLES MADE FROM POLYESTERS

James Eric McIntyre, and Michael Mundie Robertson, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 370,068, May 25, 1964, Pat. No. 3,416,952

Filed Nov. 21, 1968, Ser. No. 777,877

Claims priority, application Great Britain, June 5, 1963, Oct. 31, 1963, Oct. 31, 1963, Jan. 10, 1964, Jan. 10, 1964, 22323/63, 43055/63, 43056/63, 1230/64, 1231/64

Int. Cl. B44d *5/12*

U.S. Cl. 117—118 **6 Claims**

A process for the treatment of the shaped articles, made from an essentially linear crystallizable polyester, with a water-insoluble crystallizable polymeric compound, wherein said crystallizable polymeric compound contains within a single molecule (A) sufficient repeat units identical with those forming the crystallizable portions of the polyester to confer crystallizability on the compound and (B) at least one active group serving to modify the surface of the shaped article, the said group being selected from at least one of the following: an acidic group and a basic group, the said crystallizable polymeric compound having a melting point above 100° C., measured by the temperature of disappearance of birefringence, and the said treatment being carried out by applying the crystallizable polymeric compound to the surface of the shaped article and subjecting the shaped article with the compound to a thermal treatment at a temperature above 90° C.

3,619,270

ADHESIVE COMPOSITION

Guenter Horst Tesch, Fribourg, Switzerland, assignor to Breveteam S. A., Fribourg, Switzerland

Filed Feb. 15, 1968, Ser. No. 705,640

Claims priority, application Switzerland, Feb. 22, 1967, 2713/67

Int. Cl. C09j *7/04;* **D06n** *3/04*

U.S. Cl. 117—122 H **1 Claim**

An adhesive composition for floor coverings, particularly, though not exclusively for reinforced textile stair carpets comprises one part of contact adhesive components which are sticky at room temperature, and which bring about an adhering effect, and one part of synthetic thermoplastic components which are nonsticky at room temperature, but which, however, on heating to a temperature above 60° C. suffer temporary partial loss of their cohesion and become a strong sealing adhesive, which is adapted to form a permanent bond with the base to be bonded.

3,619,271

PROCESS FOR IMPROVING FABRICS CONTAINING CELLULOSIC FIBERS

Juerg Merz, Therwil, and Christian Guth, Basel, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Oct. 15, 1968, Ser. No. 767,841

Claims priority, application Switzerland, Oct. 19, 1967, 14627/67

Int. Cl. D06m *15/10;* **C09k** *3/28;* **C09b** *67/00*

U.S. Cl. 117—137 **4 Claims**

The present invention is concerned with the use of high molecular polyethylene glycol as a means for increasing the absorptivity of cellulosic fabrics. It is preferably used in applying to the fabric an aqueous preparation that contains a dyestuff, a flameproofing agent, a hydrophobizing agent or an antimycotic

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3,619,272

METHOD FOR COATING POLYOLEFIN OR PAPER SUPPORTS WITH CHLORINATED BUTENE-1 POLYMER COATINGS

Thomas H. Shepherd, Hopewell, and Murray H. Reich, Princeton, both of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Filed Sept. 1, 1967, Ser. No. 664,963

Int. Cl. B44d *1/098;* **B32l** *27/08*

U.S. Cl. 117—138.8UA **7 Claims**

Method for coating various substrates, and coating compositions employed therein, incorporating, as a principal constituent thereof, a chlorinated butene-1 polymer prepared by chlorination of a polymer having a melt index of from 0.1 to 60, and comprising from 20 percent to 95 percent by weight isotactic polymer. The chlorinated material contains from 3 percent to 70 percent by weight chlorine. Coatings thus provided are useful as adhesives or primer coats for polyolefin films or sheets, or as protective coatings for paperboard or other paper stock materials.

3,619,273

METHOD FOR APPLYING LONG CHAIN FATTY ACID PHENYLMERCURY FUNGICIDES IN WAX

Charles J. Conner, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture

Filed July 14, 1969, Ser. No. 841,575
Int. Cl. B44d *1/09*; **D06m** *13/50*
U.S. Cl. 117—138.5 **3 Claims**

This invention relates to a process for applying long chain fatty acid phenylmercuric fungicides. Many long chain fatty acid phenylmercuric salts are available as fungicides but application procedures have been difficult and expensive. This invention relates to a method whereby these compounds can be applied in conjunction with a wax finish, in a single bath application whereby the fungicide remains in the wax finish component of fabric treatments for water repellency and fungicidal activity.

3,619,274

COATED SYNTHETIC MATERIAL

Thomas Jefferson Proffitt, Jr., Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1967, Ser. No. 632,561
Int. Cl. D02j *3/18*; **C09k** *3/16*
U.S. Cl. 117—138.8 **1 Claim**

Improved antistatic protection has been achieved in synthetic fibers, particularly synthetic staple fibers, by treating the fibers with salts of

1. polyoxyethylene or polyoxypropylene amines; and
2. phosphoric acid esters of
   a. monohydroxy alkyl alcohols or
   b. polyoxy (ethylene or propylene) monoalkyl ethers.

Most synthetic fibers such as polyamide, acrylic and polyester fibers are hydrophobic and tend to develop and retain static charges. Before such fibers can be converted into textiles, it is necessary to apply an antistatic finish. It is most economical to apply such a finish to the fiber at the point of manufacture. This requires application to a large rope of continuous filaments travelling at high speed. A suitable finish must have a low-viscosity and a low-surface tension in solution in order to penetrate the tow rapidly. The finish on the fiber should remain nontacky even when exposed to humid air. If the finish becomes tacky, the fibers cannot be carded and spun into uniform yarns.

3,619,275

FIBROUS SHEET MATERIAL

Michael Barash, Rockville Centre, N.Y., and Benedict S. Anthony, Milford, Pa., assignors to Collagen Corp., c/o The Seagrave Corp., New York, N.Y.

Division of Ser. No. 596,742, Nov. 25, 1966, Pat. No. 3,542,910. Filed Aug. 13, 1969, Ser. No. 870,703
Int. Cl. D06n *3/00*; **D04h** *1/64*
U.S. Cl. 117—138.8 N **4 Claims**

Reconstituted sheet material is disclosed having properties at least equal to those of natural leather, said sheet material consisting essentially of leather fibers and polyamide-type synthetic resin fibers held together by an acrylic ester bonding material, the sheet being produced by forming a dry batt of the leather and synthetic resin fibers, applying a bonding material to the batt, setting the bonding material in situ, and then drying the resulting sheet.

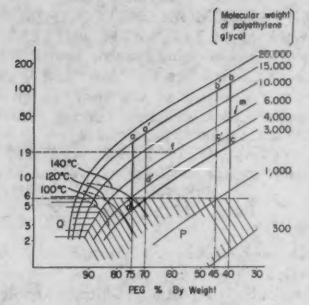
3,619,276

PROCESS FOR IMPROVING SURFACE CHARACTERISTICS OF POLYESTER SHAPED ARTICLES

Jiro Shimeha, Ikeda-shi; Takeo Shima, Iwakuni-shi; Yukiharu Asami, Iwankuni-shi; Ryuichiro Tsuzuki, Ibaragi-shi, and Norboru Yabuuchi, Ibaragi-shi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of application Ser. No. 587,313, Oct. 7, 1966, now abandoned. This application Nov. 19, 1969, Ser. No. 878,033
Claims priority, application Japan, Oct. 21, 1965, Oct. 28, 1965. Oct. 30, 1965, Feb. 28, 1966, 40/64655, 40/66460, 40/66578, 41/12176
Int. Cl. B23b *27/00*
U.S. Cl. 117—138.8 F **7 Claims**

A process of improving the surface characteristics of polyester shaped articles which comprises coating said articles with a composition comprising a copolyester consisting of (A) a water-soluble polyoxyalkylene glycol having a molecular weight of 7000–15,000, (B) terephthalic acid and (C) ethylene glycol or a copolyester consisting mainly of the



above wherein said water-soluble polyoxyalkylene glycol is present in a range of from about 40 to about 75 percent by weight and the reduced viscosity of the resultant copolyester is within the range of 0.9 to 2.0.

3,619,277

METHOD OF IMPROVING THE CREASE RESISTANCE OF A CELLULOSIC FABRIC

James Forrest Allen, deceased, late of Pennington, N.J. (by Christina L. Allen, executrix), and Harold K. Latourette, Geneva, Switzerland, assignors to FMC Corporation, New York, N.Y.

Division of Ser. No. 265,020, Mar. 12, 1963, which is a division of 118,269, June 20, 1961, abandoned. Filed Nov. 26, 1969, Ser. No. 877,581
Int. Cl. D06m *15/00*
U.S. Cl. 117—139.4 **2 Claims**

A method of treating cellulosic fabrics with 2-hydroxyethyl vinyl sulfone.

3,619,278

PROCESS FOR TREATING TEXTILE MATERIALS

Zennosuke Ogawa, Gumma-ken, Japan, assignor to Shinetsu Chemical Company, Tokyo, Japan

Filed May 21, 1969, Ser. No. 826,723
Claims priority, application Japan, June 4, 1968, 43/38200
Int. Cl. D06m *15/66*
U.S. Cl. 117—139.5 A **10 Claims**

When textile materials are treated with a silicone rubber emulsion containing, as its principal component, organopolysiloxane, prepared by emulsion polymerization of organosilane or organosiloxane, which is represented by a unit formula:

$$R_nSiO_{\frac{4-n}{2}}$$

in which R is a monovalent hydrocarbon radical containing from 1 to 18 carbon atoms and n is a mean value of from 1.9 to 2.1, the relative viscosity of which silicone rubber emulsion in a toluene solution at 25° C. is at least 1.8, the textile materials are provided with excellent flexibility and springiness, and what is more, when the silicone rubber emulsion is applied to textile materials together with known resin-finishing agents heretofore employed for the purpose of improving the properties of the textile materials, it will serve to prevent the reduction of the strength of the textile materials which is one of the disadvantages of the known textile-material treating agents.

3,619,279

TONER RECEIVING MEMBER

Herbert N. Johnston, Columbus, and Nicholas D. Gallagher, Troy, both of Ohio, assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 520,872, Jan. 17, 1966, Pat. No. 3,493,412.
Filed July 16, 1969, Ser. No. 842,356
Int. Cl. D21h *1/34*; G03g *7/00*
U.S. Cl. 117—155 UA 10 Claims

A toner receiving member having available at an external surface a solid crystalline plasticizer to reduce the fusion power requirements when toner is fused to the receiving member. The external surface of the toner receiving member is substantially free of material plasticizable by the solid crystalline plasticizer. Typically a plasticizer such as ethylene glycol dibenzoate may be available on the surface of paper.

3,619,280

TREATED PAPER AND NONWOVEN MATERIAL FOR WIPING SURFACES AND METHOD THEREFOR

Fred F. Scheuer, Bronx, N.Y., assignor to Dustikin Products, Inc., Bronx, N.Y.

Filed July 18, 1969, Ser. No. 843,223
Int. Cl. D21h *1/40*, *5/22*
U.S. Cl. 117—154 4 Claims

Tissue-type paper and nonwoven material are uniformly impregnated with a nonaqueous liquid carrier selected from liquid hydrocarbons, glycols and pine oils containing an agent uniformly distributed therein automatically, by applying a predetermined quantity of treating fluid to any portion of the nontreated material. The agent is selected from waxes, silicones and materials producing a predetermined odor. The agent does not separate from the carrier until at least the treated material is substantially impregnated, and the carrier and agent remain in the material substantially as when it was impregnated and are deposited in the same proportions as a thin film on a surface wiped by the material.

3,619,281

PROCESS FOR THE IMPROVEMENT OF TEXTILES BY THE USE OF SILICONES AND HARDENING ACCELERATORS

Horst Kroning, Dresden; Christian Dathe, Radebeul, and Richard Muller, Radebeul, all of Germany, assignors to Institut fur Silikon-und Fluorkarbon-Chemie, Radebeul, Germany

Filed Feb. 7, 1969, Ser. No. 797,682
Int. Cl. D06m *15/66*
U.S. Cl. 117—161 ZA 7 Claims

Process for the improvement of fibrous materials, particularly in the finishing of textiles, by the use of silicones and hardening accelerators, which comprises treating the materials with aqueous emulsions of silicones and using as hardening accelerators an addition compound of aminoalkyltrifluorosilane and hydrofluoric acid. The fibrous materials thus treated exhibit an excellent and lasting water repellence and a high resistance to rubbing off of colors.

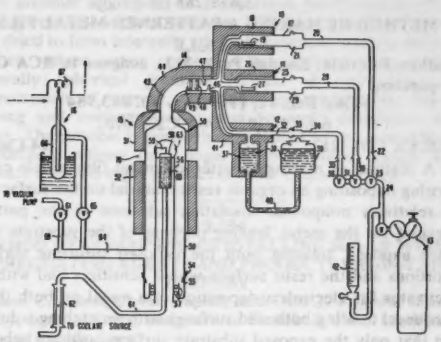
3,619,282

METHOD FOR VAPOR GROWING TERNARY COMPOUNDS

Gerald W. Manley, Johnson City, N.Y.; Philip S. McDermott, Athens, Pa.; Edward S. Pan, Wappingers Falls, N.Y., and Ralph J. Riley, Apalachin, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 27, 1968, Ser. No. 763,147
Int. Cl. H01l *7/36*; C23c *13/04*
U.S. Cl. 117—201 7 Claims

Ternary epitaxial films are grown from a gaseous mixture consisting of mercury, cadmium, and tellurium mixed with an inert or unreactive gas such as hydrogen. The mixture is heated to a temperature to prevent binary combinations and then rapidly cooled to the point of supersaturation by flowing the mixture through a thermal gradient having equithermal lines substantially parallel to the growth surface of a substrate.

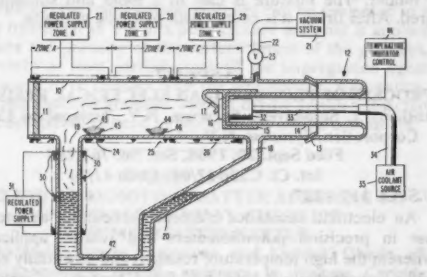


3,619,283

METHOD FOR EPITAXIALLY GROWING THIN FILMS

Donald R. Carpenter, Vestal; Gerald W. Manley, Johnson City, N.Y.; Philip S. McDermott, Athens, Pa., and Ralph J. Riley, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 27, 1968, Ser. No. 763,307
Int. Cl. C23c *13/08*; B05c *11/14*; C23c *13/00*
U.S. Cl. 117—201 12 Claims



A monocrystalline material of the formulation $Hg_{(1-x)}Cd_{(x)}Te$ is grown epitaxially on a seed or substrate monocrystal of Cd Te, or the like. The reactants are mixed in the vapor phase and held at a temperature which prevents binary combinations. The ternary vapor phase mixture is then rapidly cooled to supersaturation and condensed on the seed crystal substrate. In a dynamic system, the mercury vapor acts as a carrier gas as well as a reactant.

3,619,284

ELECTROCONDUCTIVE PAPER AND PROCESS OF MAKING SAME

Dilip K. Ray-Chaudhuri, Somerset; Stanley Field, Piscataway, and Irving D. Hodgkin, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed Apr. 16, 1969, Ser. No. 816,777
Int. Cl. G03g *5/00*
U.S. Cl. 117—201 8 Claims

A paper having a surface adapted for electrostatic printing and a process for preparing such paper; said paper containing

at least one monoquaternary nitrogen compound which serves as the electrostatic electroconductive medium.

3,619,285

METHOD OF MAKING A PATTERNED METAL FILM ARTICLE

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation

Filed Dec. 10, 1969, Ser. No. 883,984
Int. Cl. G03c 5/00; C23b 5/62
U.S. Cl. 117—212 14 Claims

A method of making a patterned metal film article comprising depositing an organic resist material on the surface of a relatively nonporous insulating substrate in the pattern desired for the metal, leaving portions of the substrate surface exposed, treating both the exposed substrate surface portions and the resist surface with a sensitizer and with an activator for electroless deposition of a metal on both these surfaces, treating both said surfaces with an etching solution so that only the exposed substrate surface portions become deactivated, and treating both the surfaces with an electroless metal plating solution such that metal deposits only on the resist surface.

3,619,286

CAST GRAPHITE ELECTRODES FOR EDM APPLICATIONS

Ludwik Gutnajer, Carversville, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Dec. 18, 1968, Ser. No. 784,893
Int. Cl. C01b 31/04; H01m 13/02
U.S. Cl. 117—226 1 Claim

A no-wear graphite electrode for electrodischarge machining. The electrode is cast from powdered graphite mixed with a binder. The mixture is cast in a mold and subsequently fired. After firing, it is coated with pyrolytic graphite.

3,619,287

PROCESS OF PRODUCING AN ELECTRICAL RESISTOR

Anthony J. Stankavich, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 20, 1968, Ser. No. 761,184
Int. Cl. C23c 17/00; C04b 41/14
U.S. Cl. 117—227 3 Claims

An electrical resistance element particularly adapted for use in precision potentiometers and related applications wherein the high temperature resistant and essentially electrically nonconductive base has fused thereon a resistance material comprised of powdered glass and metal resinate suitably treated and admixed with precious metal powders with which in the mixing process is combined an organic vehicle preferably provided by ethyl cellulose dissolved in an alcohol exemplified by 1-undecanol or 1-decanol or equivalents thereof. The instant invention as applied to a ceramic substrate assures uniformly successful results in the printing process, and among other advantages contributes significantly to increased shelf life for the material being applied.

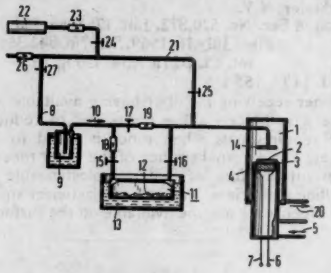
3,619,288

PROCESS FOR PRECIPITATING A HIGH MELTING METAL CONTACT LAYER AT LOW TEMPERATURES

Erhard Sirtl, Midland, Mich., assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 22, 1969, Ser. No. 886,946
Claims priority, application Germany, Jan. 2, 1969, P 19 00 119.5
Int. Cl. C23c 11/02
U.S. Cl. 117—227 15 Claims

A method for precipitating a high melting metal contact layer, at low temperatures, through thermal dissociation of a gaseous compound of the high melting contact metal and precipitating the same upon a carrier body, preferably of semiconductor material. The metal contact layer is



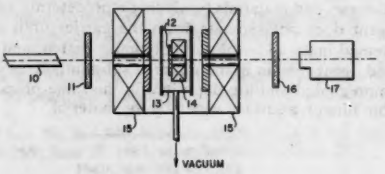
precipitated upon the carrier body through thermal dissociation of the easily volatile trifluorophosphine or trifluorophosphine hydride of the respective metals.

3,619,289

PREPARATION OF MANGANESE BISMUTH

Di Chen, Minnetonka; Roger W. Honebrik, Minnetonka, and Gary N. Otto, Mayer, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 2, 1968, Ser. No. 695,042
Int. Cl. C23c 13/04; H01f 1/14
U.S. Cl. 117—235 8 Claims



The preparation of manganese bismuth involved a long heat treatment in the prior art. Using a laser beam monitoring system to make real time measurements of the magneto-optic effect in manganese bismuth while forming the compound has reduced the time required for heat treatment from approximately 68–72 hours to a matter of about 20 minutes or less.

3,619,290

METHOD OF MAKING MAGNETIC TRANSFER SHEET AND ARTICLE

James E. Deegan, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 19, 1968, Ser. No. 746,194
Int. Cl. R41m 5/10
U.S. Cl. 117—235 8 Claims

Carbon paper coatings of the type embodying a vinyl resin matrix which embraces a pigment-carrying nonvolatile liquid exudable under pressure to make a mark on a copy sheet, are provided. The coating is of such character that pigments having a high agglomerative tendency, especially magnetic pigments such as iron oxide, can be used and still be carried properly from the layer along with the liquid vehicle when pressure is applied. In the case of magnetic pigments this makes it possible to provide marks which embody sufficient pigment to give appropriate signal strength for scanning. The result is achieved by including in the mixture an amine type wetting agent, and by providing as a portion of the volatile vehicle used to render the mixture coatable a pair of control solvents of different types. The control solvents are one of the ketone type and the other of a nonketone type (such as ethyl acetate, 2-nitro propane, or equivalent). The optimum ratio between the control solvents is usually between about 1:2 and about 1:1.

3,619,291

DESOLVENTIZING OF STARCH

Felix Joseph Germino, Palos Park; Joseph Frank Stejskal, Brookfield, and William Edward Schaffrath, Chicago, all of Ill., assignors to CPC International Inc.

Filed Sept. 6, 1968, Ser. No. 758,122
Int. Cl. C13l *1/04, 1/00, 3/00*
U.S. Cl. 127—71 14 Claims

Starch which has been treated with a hydrophilic organic solvent, such as a low molecular weight alcohol, ketone, or the like, and which, as a result, retains relatively large quantities of these solvents, is desolventized by admixing it with a gel retarding salt, and heating the admixture to a temperature above about 150° F. The process is applicable to any type or variety of starch in nongelatinized form; the process does not gelatinize or otherwise affect the properties of the starch.

3,619,292

TABLETS AND METHOD OF FORMING

Robert E. Brouillard, and Charles L. Griffith, both of Cedar Rapids, Iowa, assignors to Penick & Ford, Limited, Cedar Rapids, Iowa

Filed July 15, 1968, Ser. No. 744,645
Int. Cl. C13f *3/00*
U.S. Cl. 127—29 9 Claims

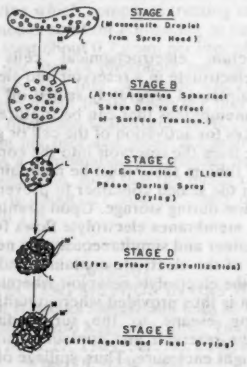
Massecuite Aggregated Total Sugar granules are employed as a binder or binder-filler in the manufacture of compressed tablets, preferably by direct compression of a particulate tableting composition into which the Total Sugar granules have been blended. In some embodiments, the Total Sugar granules also function as an absorbent carrier, and/or as a tablet disintegrator or solubilizer. The Massecuite Aggregated Total Sugar (MATS) granules of high D.E. comprise generally spherical aggregates of cohered microcrystals of dextrose internally containing the residual oligosaccharides of the starch hydrolysis in solid solution, the granules being free-flowing, nonhygroscopic, porous and compressible.

3,619,293

GRANULAR SUCROSE PRODUCTS AND PROCESS FOR PRODUCING SAME

Masahiro Niimi; Tetsu Furukawa, and Hitoshi Masada, all of Tokushima, Japan, assignors to Nippon Shiryo Kogyo Co., Ltd., Tokushima, Japan

Continuation-in-part of application Ser. No. 412,259, Nov. 18, 1964, now abandoned, Continuation-in-part of application Ser. No. 593,372, Nov. 10, 1966, now abandoned Continuation-in-part of application Ser. No. 626,399, Mar. 28, 1967, now abandoned, Continuation-in-part of Ser. No. 674,168, Oct. 10, 1967, Pat. No. 3,540,927. This application Feb. 18, 1970, Ser. No. 12,361
Int. Cl. C13f *1/02*
U.S. Cl. 127—30 6 Claims


STAGE A
(Massecuite Droplet from Spray Head)
STAGE B
(After Assuming Spherical Shape Due to Effect of Surface Tension.)
STAGE C
(After Contraction of Liquid Phase During Spray Drying)
STAGE D
(After Further Crystallization)
STAGE E
(After Aging and Final Drying)

Granular crystalline sucrose products are prepared from water solutions of sucrose containing noncrystallizable sugar, such as molasses. The sugar solution is subjected to partial crystallization to form a pumpable massecuite composed of microcrystals of sucrose dispersed in a water solution of the sucrose containing the molasses or other noncrystallizable sugar. The massecuite is sprayed into a drying air stream to form atomized droplets, and part of the water is removed to form granular aggregates of the sucrose microcrystals containing residual sucrose solution. The aggregates are aged and dried to form internally additional sucrose crystals and to further reduce water content. The products, comprising generally spherical granules formed of aggregates of microcrystals of sucrose, are characterized by being free-flowing and nonhygroscopic, and by rapid dissolution in water. The process is particularly adapted to the processing of partially refined cane sugar or beet sugar liquors to produce a brown sugar product of these characteristics.

3,619,294

METHOD OF COMBINING CRYSTALLINE SUGAR WITH IMPREGNATING AGENTS AND PRODUCTS PRODUCED THEREBY

William C. Black, Cedar Rapids, and Otto J. Rajtora, Iowa City, both of Iowa, assignors to Penick & Ford Limited, Cedar Rapids, Iowa

Filed July 15, 1968, Ser. No. 744,642
Int. Cl. C13k *1/00*
U.S. Cl. 127—30 15 Claims

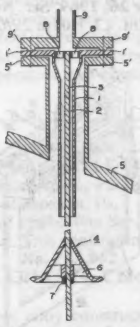
Massecuite Aggregated Microcrystalline Sugar granules (structurally comprising cohered sugar microcrystals with internal capillary networks) are employed as a means to combine crystalline sugar with solid or liquid modifying agents which are dissolved (or otherwise dispersed) in an aqueous or organic solvent carrier, which is sprayed (or otherwise applied) onto a bed of the granules while they are being agitated and intermixed. The liquid carrier and modifying agent are absorbed into the granules to achieve internal impregnation thereof. Where the liquid carrier is relatively volatile compared to the modifying agent, as when the added substance is normally a solid, the carrier can be evaporated leaving the added substance within the granules. Either with or without removal viz by evaporation or drying) of the liquid carrier, the impregnated granules can be subjected to a second treatment in which a pore closure material is applied to reduce the porosity of the surface layers of the granules, and thereby at least partially seal off the impregnated agent from escape to or contact with the atmosphere. Alternatively, the impregnated granules without drying and/or subjected to a second treatment can be packaged in sealed containers.

3,619,295

METHOD OF REMOVING MATTER ADHERING TO INNER WALL OF VINYL CHLORIDE POLYMERIZATION KETTLE

Kozo Nishizaki; Tetuzo Yamazawa, and Yoshiaki Okuda, all of Okayama-ken, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1969, Ser. No. 815,142
Claims priority, application Japan, Aug. 7, 1968, 43/55507
Int. Cl. B08b *9/00, 3/10*
U.S. Cl. 134—22 R 1 Claim



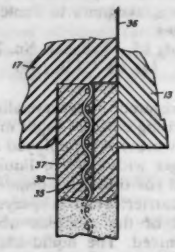
In removing the polymeric vinyl chloride which remains adhering to the inner wall of a polymerization kettle after

having withdrawn the polymerization reaction product from the kettle wherein the polymerization of polymeric vinyl chloride has been completed, the method of removing the adhering polymeric vinyl chloride which comprises drying said adhering matter by heating it under ventilative condition at a temperature 40–80° C. to reduce the moisture content of the adhering matter to below 15 percent and thereafter spraying 1,2-dichloroethane against the dried adhering matter to thereby remove the adhering matter consisting of polymeric vinyl chloride, and an apparatus for practising the above method.

3,619,296
FUEL CELL ELECTRODE

Leonard W. Niedrach, and George J. Haworth, both of Schenectady, N.Y., assignors to General Electric Company

Filed Dec. 26, 1967, Ser. No. 699,004
Int. Cl. H01m *27/04, 13/00*
U.S. Cl. 136—86 D **6 Claims**

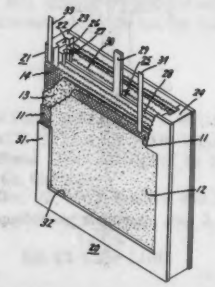


A fuel cell electrode is composed of catalytic and gas adsorbing materials which consist of a chromium-tungsten oxide as a support, a metal dispersed on the support, the metal selected from the class consisting of noble metals and alloys of noble metals, a current collector, and a binder bonding the materials together and to the current collector in electronically conductive relationship. Further, the catalytic and gas adsorbing materials comprise a chromium-tungsten oxide as a support, a support of carbon with boron dissolved therein, a mixture of carbon with boron dissolved therein and boron carbide, or carbon, and a metal dispersed on both of the supports, the metal selected from the class consisting of noble metals and alloys of noble metals. An adhesive binder is employed which is not chemically attacked by the electrolyte or the reactant fluid of the cell in which the electrode is used. Such an electrode is particularly useful in a fuel cell employing a fuel containing carbon monoxide, such as reformer gas, an acid electrolyte, and under various operating conditions.

3,619,297
METHOD OF CHARGING SECONDARY METAL-AIR CELL

Paul J. Moran, Ballston Lake, N.Y., assignor to General Electric Company

Filed June 26, 1969, Ser. No. 836,778
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 A **1 Claim**

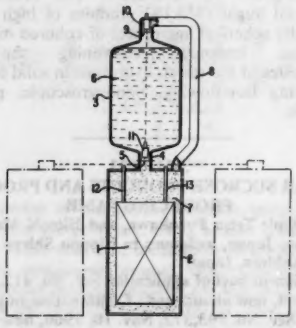


A composite gas diffusion electrode has an electrically conductive porous substrate, a noble metal or non-noble metal catalytic material impregnated into the substrate, and a porous, electrically conductive sheet adjacent to and spaced from one surface of the substrate and electrically insulated therefrom, the porous sheet having a lower oxygen overvoltage than the substrate, and electrical insulation means disposed between the sheet and the substrate. A modified gas diffusion electrode has electrical insulation means of at least one chemically inert, porous separator positioned between the substrate and the porous sheet. During the charging of a cell employing the above types of electrodes, the porous sheet provides isolation of oxygen gassing at the porous sheet while the porous separator provides additional physical spacing of the oxygen gassing at the porous sheet from the catalytically impregnated substrate.

3,619,298
DEFERRED-ACTION ELECTROCHEMICAL GENERATORS

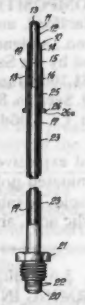
Jean Firmin Jammet, Poitiers; Alain Blondel, Lillebonne, and Yannick Marsault, Poitiers, all of France, assignors to Societe Des Accumulateurs Fixes Et De Traction (Societe Anonyme), Point de La Folie, Romainville, France

Filed July 31, 1970, Ser. No. 59,994
Claims priority, application France, Aug. 1, 1969, 6926542
Int. Cl. H01m *21/10*
U.S. Cl. 136—114 **12 Claims**



Deferred-action electrochemical cells or generators wherein the electrolyte in a reservoir and electrodes in a container are maintained separately sealed off from each other by frangible membranes that can be ruptured by appropriate priming devices for activation of the cell or generator by flow of electrolyte from the reservoir into the container. In case of electrodes of lithium these must be maintained in an inert or neutral gas in the sealed container to prevent their alteration or deterioration during storage. Upon priming or breaking of the frangible membranes electrolyte flows from the reservoir into the container and simultaneously the neutral or inert gas is driven out of the electrode container and is directed via a conduit into the electrolyte reservoir wherein it is retained. A closed system is thus provided wherein neither electrolyte or inert gas can escape to the surrounding environment. Preferably, the reservoir and containers are enclosed in an overall fluidtight enclosure. Thus, spillage of electrolyte from the primed cell or generator upon vibration, irregular movements or overturning of the primed cell or generator and its loss to environment is avoided, as is damage from spilled electrolyte. At the same time, operation of the cell or generator continues undisturbed.

3,619,299
THERMOCOUPLE
Paul Weinmann, Aich; Otto Pauling, Kirchheim/Tech; Franz Macho, Kirchheim/Tech; Hans Wiedenmann, Altbach/N.; Adolf Krajc, Wernau-Neckar, and Ruth Korner, Plochingen/Neckar, all of Germany, assignors to Junkers & Co. G.m.b.H., Wernau, Germany
Filed Oct. 28, 1968, Ser. No. 771,033
Claims priority, application Germany, Nov. 4, 1967, P 15 39 296.8
Int. Cl. H01v *1/02*
U.S. Cl. 136—228 **3 Claims**



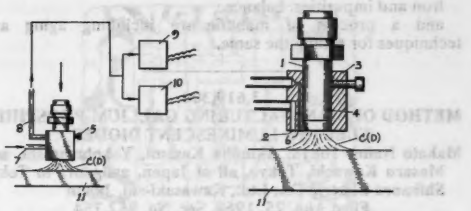
A thermocouple wherein the tubular outer conductor of the head is connected with the ground by way of a drawn tube a portion of which is expanded radially to snugly receive a portion of the outer conductor. The tube is provided with an external flange or with external threads to facilitate adjustable or nonadjustable fastening of the thermocouple in a support, such as the housing of a safety igniter in a range or oven.

3,619,300
PHOSPHATE CONVERSION COATING OF ALUMINUM, ZINC OR IRON
Ferdinand Phillip Heller, Philadelphia; Mark Allen Kuehner, North Hills, and Lester Steinbrecher, Southampton, all of Pa., assignors to Amchem Products, Inc., Lower Gwynedd Township, Montgomery County, Pa.
Filed Nov. 13, 1968, Ser. No. 775,517
Int. Cl. C23f *7/10, 7/12, 7/14*
U.S. Cl. 148—6.15 **7 Claims**

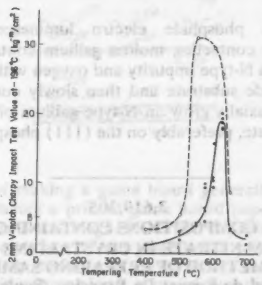
A zinc phosphate coating process for coating a metal surface consisting of aluminum, iron or zinc or alloys of aluminum, iron or zinc which comprises treating said metal surface with an aqueous solution containing as its essential ingredients, (a) at least about 0.7 gram per liter of zinc ion, (b) at least 1 gram per liter of phosphate ion 3as PO_4), (c) at least about 1 gram per liter of nitrate ion (calculated as NO_3), (d) between about 0.006 gram per liter and about 1 gram per liter of nitrite ion (calculated as NO_2), (e) between about 0.025 gram per liter and about 2.5 grams per liter of fluoride added as a combination of fluorides and bifluorides of sodium and potassium, such that the molar ratio of potassium to sodium is about 2:1 and the ratio of fluoride to bifluoride is about 1:1.

3,619,301
UNCUT DETECTING METHOD IN GAS WORKING
Roku Suzuki, and Hidetaka Shigeizumi, both of Tokyo, Japan, assignors to Koike Sanso Kogyo Co. Ltd., Tokyo, Japan
Filed Mar. 27, 1969, Ser. No. 810,961
Int. Cl. B23k *7/00*
U.S. Cl. 148—9 **11 Claims**

This invention provides a method for detecting "uncut" condition in gas workings, in particular in cutting works. The detection is performed by making use of two back pressures generated by pressurized fluid ejected from a jet located adjacent a nozzle and different with whether the gas from a nozzle is in a flame flow or a noncombustion flow.



3,619,302
METHOD OF HEAT-TREATING LOW TEMPERATURE TOUGH STEEL
Koichi Aoki, Yokohama; Seinosuke Yano, Kamakura; Hiroshi Mimura, Tokyo; Tohru Inoue, Tokyo, and Hiroshi Sakurai, Kawasaki, all of Japan, assignors to Yawata Iron & Steel Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1968, Ser. No. 776,421
Int. Cl. C21d *1/26, 7/14*
U.S. Cl. 148—12 **8 Claims**



Heat-treating method of hot-rolled steel plate containing 1.5% to 10.0% Ni, 0.1% to 5.0% Mn and further at least one element selected from the group consisting of Mo, Cu, Cr, Nb and V, at need and the balance being substantially Fe, comprising subjecting one or more times repeatedly said hot-rolled steel plate to heating to and sequent quenching from a temperature within the range between Ac_1 and Ac_3 points, then subjecting the steel plate to tempering treatment at a temperature below Ac_1 point, thereby to improve largely toughness at low temperature and obtain excellent workability.

3,619,303
LOW ALLOY AGE-HARDENABLE STEEL AND PROCESS
Frederick J. Semel, Philadelphia, Pa., assignor to Alan Wood Steel Company, Conshohocken, Pa.
Continuation-in-part of application Ser. No. 749,274, Aug. 1, 1968, now abandoned. This application Dec. 18, 1968, Ser. No. 785,862
Int. Cl. C21d *7/14;* **C22c** *41/02*
U.S. Cl. 148—12.3 **26 Claims**

A ferrite-carbide low alloy constructional steel in the aged condition or capable of aging having the following composition:

Carbon	0.10% max.
Manganese	0.30 to 1.50%.
Silicon	0.35 max.
Molybdenum	0.04 to 0.50%.
Niobium	0.005 to 0.075%.

Iron and impurities, balance,

and a process of manufacture including aging and techniques for rolling the same.

3,619,304

METHOD OF MANUFACTURING GALLIUM PHOSPHIDE ELECTRO LUMINESCENT DIODES

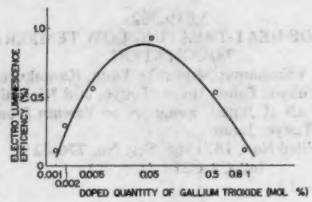
Makoto Naito, Tokyo; Akinobu Kasami, Yokohama-shi, and Masaru Kawachi, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 25, 1969, Ser. No. 852,754

Claims priority, application Japan, Aug. 30, 1968, 43/61775 Mar. 8, 1969, 44/177797

Int. Cl. H01l *7/38, 7/46;* H05b *33/00*

U.S. Cl. 148—171 10 Claims



A gallium phosphide electro luminescent diode is fabricated by contacting molten gallium containing gallium phosphide, an N-type impurity and oxygen with a P-type gallium phosphide substrate and then slowly cooling the substrate to epitaxially grow an N-type gallium phosphide layer on the substrate, preferably on the (111) phosphorus surface thereof.

3,619,305

EXPLOSIVE COMPOSITIONS CONTAINING EXPANDED AMMONIUM NITRATE IN CRYSTALLINE FORM AND METHOD OF PREPARING SAME

Jacques Chatel de Raguet De Brancion, Boulogne sur Seine, France, assignor to Societe d'Explosifs et de Produits Chimiques

Continuation-in-part of application Ser. No. 558,273, June 17, 1966, now abandoned. This application Feb. 26, 1968, Ser. No. 708,443

Int. Cl. C06b *19/00*

U.S. Cl. 149—2 23 Claims

An explosive composition containing as an essential ingredient ammonium nitrate in fine crystalline form having a specific surface greater than 500 cm^2/g. The ammonium nitrate in this form is obtained by crystallization from an aqueous solution in the presence of a tensio-active agent such as laurylamine acetate.

3,619,306

MOLDED EXPLOSIVE BODIES HAVING VARIABLE DETONATION SPEEDS

Adolf Berthmann, Leverkusen; Gerhard Martin, Troisdorf, and Maximilian Klunsch, Opladen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Sept. 12, 1968, Ser. No. 759,501

Claims priority, application Germany, Sept. 13, 1967, D 54099

Int. Cl. F42b *1/00*

U.S. Cl. 149—18 6 Claims

Process of manufacturing molded explosive bodies so that their detonation speeds can be varied within a defined range by reducing the density of the molded body. The reduction in density can be effected by incorporating into the starting components, porous, voluminous or air-containing materials. The solidification of the resulting compositions is thereafter carried out by incorporating into the above starting components a suitable binding agent, varying the working pressure in the forming of the bodies, or suitably regulating the sintering conditions.

The resultant bodies are characterized by their reduced densities and therewith reduced detonation speeds and by their high-mechanical strengths.

3,619,307

COPOLYESTER EXPLOSIVE OR PROPELLANT COMPOSITIONS

Martin Hauser, West Hartford, and George Sidney Sprague, Stamford, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy

Division of Ser. No. 651,100, June 29, 1961. Filed June 3, 1969, Ser. No. 830,151

Int. Cl. C06d *5/06*

U.S. Cl. 149—19 4 Claims

Rocket propellant and explosive compositions containing, as binders, carboxy-terminated polyester resins comprising a saturated dicarboxylic acid, a saturated diol and 2-methyl-1,2,3-propanetricarboxylic acid, are disclosed.

3,619,308

METHOD OF FORMING IN PLACE A GELLED AQUEOUS SLURRY EXPLOSIVE

Allen Lemoyne Caldwell, Prairie Village, and Dale S. Partridge, Shawnee Mission, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1968, Ser. No. 772,858

Int. Cl. C06b *1/04*

U.S. Cl. 149—60 4 Claims

The extrudability of an aqueous slurry explosive stabilized with a gelled polysaccharide gum is improved by incorporating an effective amount of water-soluble polyacrylamide in the composition. Preferably this is accomplished by injecting into the exit stream of the pump a solution of borax as gelling agent and polyacrylamide to reduce resistance of the gel to extrusion through a tubular conduit into the desired location.

3,619,309

TREATMENT OF ALUMINUM OXIDE SURFACES WITH MOLTEN VANADIUM PENTOXIDE

Marc Marian Faktor, Bushey; George Reginald Newns, Ealing, London, and Dennis Gordon Fiddyment, London, all of England, assignors to Her Majesty's Postmaster General, London, England

Filed Jan. 26, 1968, Ser. No. 700,898

Claims priority, application Great Britain, Feb. 3, 1967, 5,347/67

Int. Cl. C23f *1/04;* C23g *1/00*

U.S. Cl. 156—2 12 Claims

Surface irregularities of a crystalline aluminum oxide member, such as an α-corundum crystal, are removed by treatment with molten vanadium pentoxide, preferably at temperatures exceeding 800° C. The treatment may be carried out in more than one stage, using a fresh vanadium pentoxide melt in each stage.

3,619,310

METHOD OF MAKING LIQUID-FILLED PRESSURE-DISTRIBUTING PADS USED IN PRESSES

Kenneth Clarke, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

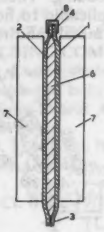
Continuation-in-part of application Ser. No. 775,019, Nov. 12, 1971, now abandoned. This application Nov. 6, 1969, Ser. No. 874,465

Int. Cl. B32b *1/10, 31/20*

U.S. Cl. 156—145 6 Claims

Rectangular flat surfaced cushion plates, for use as pressure distributing pads in pressing operations, are made by

seam welding two flexible metal sheets together around three sides of the desired rectangle, introducing a cushioning liquid to form a layer between the two sheets, then closing the



fourth side of the rectangle by seam welding and then subjecting the resultant convex surface sachet structure to pressure between the platens of the press to permanently deform the metal sheets in the vicinity of the welds.

3,619,311

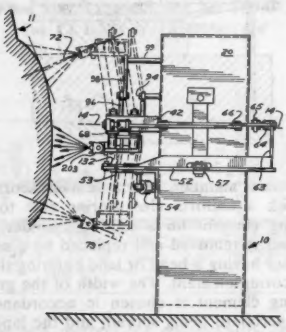
METHOD OF PROGRAMMING A CONTROLLER

Glenn R. Rose, St. Paul, and Robert S. Hedin, Minneapolis, both of Minn., assignors to Programmed & Remote Systems Corporation, St. Paul, Minn.

Division of Ser. No. 838,020, June 19, 1969, Pat. No. 3,561,398, which is a continuation of application Ser. No. 561,882, June 20, 1966, now abandoned. Filed July 2, 1970, Ser. No. 52,018

Int. Cl. B31b *1/62*

U.S. Cl. 156—62 **4 Claims**



A method of programming a controller for an oscillating spray painter to paint an object that moves past the sprayer. A scale drawing of the object is superimposed on a developed layout of the path of the sprayer. A control member for the controller is divided into sections corresponding to the strokes of the sprayer and the points where painting should begin and stop during each stroke of the sprayer are determined from the scale drawing and then correspondingly placed on the control member.

3,619,312

METHOD FOR APPLYING MONOGRAMS ON DECORATIVE ARTICLES OR THE LIKE

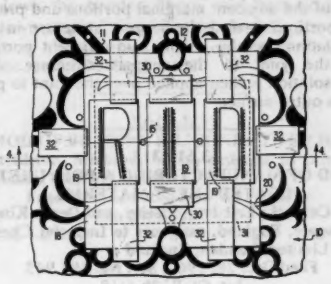
Samuel D. Berlin, Stevenson, Md., assignor to General Crafts Corporation, Baltimore, Md.

Filed Nov. 4, 1968, Ser. No. 773,258

Int. Cl. B32b *31/16, 31/22*

U.S. Cl. 156—62 **3 Claims**

A method by which monograms can be placed within a decorative design area of an ornamental panel. Selected monogram letters are positioned on an initial positioning guide sheet which has a replica of the design of the ornamental panel printed thereon. The guide is then placed on the panel with matching design portions in proper position and with a sheet of carbon paper or the like interposed



therebetween. The letters are then traced with a pencil or pen resulting in the transfer of the same to the ornamental panel.

3,619,313

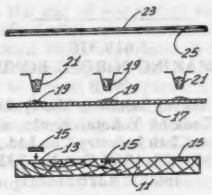
BOARD FOR MOUNTING MAGNETIC ELEMENTS

Joseph Szuch, 3842 Bentley Ave., Culver City, Calif.

Filed Oct. 31, 1969, Ser. No. 873,019

Int. Cl. B29j *5/00*

U.S. Cl. 156—62.2 **8 Claims**



A method of making a game board generally comprising the steps of placing a printed game board paper over a fixture having permanent magnets therein, depositing magnetic material on the surface of the game board paper, removing excess magnetic material from the surface of the game board paper, and positioning a plastic material over the game board paper such that the magnetic material on the paper is captured in adhesive which also serves to bond the plastic to the game board paper.

3,619,314

METHOD OF JOINING ADJACENT SHEETS OF ELASTOMERIC MATERIAL ON A SUPPORT STRUCTURE

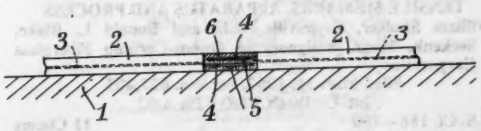
Marcel Ecureux, Paris, France, assignor to Strati-France S. A., Paris, France

Filed Dec. 27, 1968, Ser. No. 787,492

Claims priority, application France, Jan. 5, 1968, 135,006

Int. Cl. E04f *13/00*

U.S. Cl. 156—71 **1 Claim**



A method of joining adjacent sheets of elastomeric material to each other and to a support structure. Each sheet includes at least a top and bottom layer of elastomeric material

and a layer of reinforcing textile material disposed therebetween and having marginal portions extending beyond said top and bottom layers. The novel method comprises the steps of applying a liquid elastomer solution to the underside of the adjacent marginal portions and pressing the marginal portions against the support structure in an overlapping relation thereby joining said adjacent portions and adhering the joint to the support structure. A liquid elastomer solution is then applied over the joint to provide a continuous outer surface.

3,619,315

METHOD OF MANUFACTURING A POLYURETHANE COATED SHEET MATERIAL

David Ian Carrack; Eric Ivan Riseley, and Derek Kingston, all of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 20, 1967, Ser. No. 691,945
Int. Cl. B32b *5/18*
U.S. Cl. 156—77 **4 Claims**

A method for the manufacture of a coated sheet material having an improved flex-life, comprising applying to a flexible fibrous substrate having at least one base layer of a cured polyurethane composition, a relatively thin adhesive layer of a curable polyurethane composition dissolved in an organic solvent; allowing the solvent to evaporate from the adhesive layer for a time sufficient for the adhesive layer to become substantially dry, but insufficient for significant curing thereof to take place, laminating to the substantially dry adhesive layer a layer of a dried and cured, or partially cured, polyurethane composition supported on a release band; and removing the release band after final curing of the or each layer.

3,619,316

PROCESS OF MAKING POROUS, BONDED FIBROUS WEB

Shigeru Ishida, Fukaya, Saitama; Masayuki Yonei, Fukaya, Saitama, and Tadashi Yokota, Kyoto, all of Japan, assignors to Nippon Cloth Industry Co., Ltd., Kyoto, Japan

Filed May 28, 1968, Ser. No. 732,550
Int. Cl. B32b *5/18*
U.S. Cl. 156—77 **4 Claims**

Sheets comprising fibrous materials which are soft, excellent in mechanical properties, smooth at the surface thereof, and high in air and moisture permeability are produced by the steps of

1. bonding fiber webs with another using a binder (A) having plasticizing or molding ability at a temperature lower than a melting point or degrading temperature of the fibers constituting the fiber webs,

2. bonding further the whole webs together by impregnating or filling the interstices remaining with the molded webs with a binder (B) without dissolving or swelling the constituent fibers and the binder (A), and

3. dissolving the binder (A) to remove therefrom using a solvent which dissolves the binder (A) but not the constituent fibers and the binder (B).

As the binder (A), there may be used starch, dextrin, carboxymethylcellulose, methylcellulose, casein, polyethylene oxide, polyvinyl chloride, polyvinyl alcohol, polyvinyl acetate or the like. As the binder (B), there may be polyvinyl chloride, polyvinyl acetate, polyvinyl alcohol, polyamide, polyester, polyacrylate, polyurethane, synthetic rubber of every kind, natural rubber or the like.

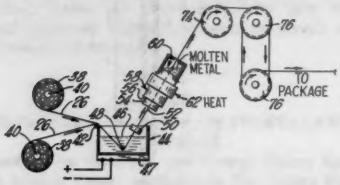
3,619,317

TENSILE MEMBERS, APPARATUS AND PROCESS

William Shulver, Saylesville, R.I., and Donald L. Blake, Seekenk, Mass., assignors to Owens-Corning Fiberglass Corporation

Filed Mar. 31, 1967, Ser. No. 627,405
Int. Cl. D04h *3/08;* **B29c** *6/02*
U.S. Cl. 156—180 **11 Claims**

Composite tensile members made up of a plurality of line-type tensile elements, such as continuous glass fibers, embedded in an encapsulating matrix of hardenable material, such as thermosetting resin, hardenable metal, etc. The glass fibers (line-type tensile elements) are carefully oriented in side-by-side relationship so that they are all substantially equally load bearing, so as to support a designed load without incurring individual fiber breakage. The matrix helps distribute the interfiber loading. Thus, all fibers are utilized. Though specifically applicable to nonyielding line-type tensile elements, fibers of metals and resins might also be used



in the product and process. On a strength to weight ratio, strengths 5.x the best steel wires in conventional cables, are provided in the unique composite members of the invention, using continuous glass fibers.

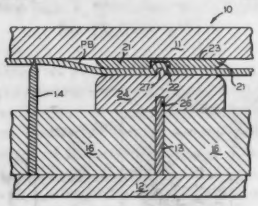
Apparatus and process for producing the composite tensile members wherein a molten bath is used as the direct heat-transfer and pressurizing medium.

3,619,318

METHOD AND APPARATUS FOR PREPARING SCORING DIES

Richard S. Shultz, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 27, 1969, Ser. No. 853,370
Int. Cl. B29d *24/00*
U.S. Cl. 156—215 **4 Claims**



A male-female member and a female scoring element cooperate with a uniform size scoring rule to locate the female scoring element on a scoring cylinder. The male-female member is removed and replaced by a second male-female member having a bead or land entering the groove of the female scoring element. The width of the groove of the female scoring element is chosen in accordance with the caliper of paperboard being scored, and the land enters the groove of the female scoring element to an extent placing a proper score in the board. The distance between the cylinder supporting the female scoring element and the rule chase and the dimensions of the male-female member and the female scoring element are so chosen that the paperboard fits nicely between the male-female member and female scoring element, which are in confronting relationship, so that deformation of the paperboard takes place only at the score being formed.

3,619,319

METHOD OF MAKING A COMPOSITE REINFORCED SYNTHETIC RESIN SHEET MATERIAL

Kastulus Utz, Freising, Germany, assignor to Alkor-Werk Karl Lissman KG, Munich-Solln, Germany

Filed July 1, 1968, Ser. No. 741,575
Claims priority, application Germany, July 5, 1967, A 56196
Int. Cl. B32b *31/00*
U.S. Cl. 156—229 **11 Claims**

The specification describes a method of making a sheet material in which strips of plastic laminate are woven, knitted or otherwise made into a textile product which is then subjected to fixation, for instance by heat so that the strips are connected together. Owing to the outer layers of the

laminated strips having a lower melting point fixation can be carried out without affecting the inner layers of the laminated strips which may have been stretch-orientated and maintain this orientation during the fixation process.

3,619,320

PRODUCTION OF PLANE THREE-PLY MATERIALS FOR PLANE BUILDING COMPONENTS

Heinz Mueller-Tamm, Ludwigshafen/Rhine, and Hans Frielingsdorf, Bad Duerkheim, both of Germany, assignors to Badische Anilin & Soda-Fabrik Aktienzesellschaft, Ludwigshafen am Rhine, Germany

Filed Aug. 30, 1968, Ser. No. 756,376
Claims priority, application Germany, Sept. 7, 1967, P 17 04 493.8
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 **4 Claims**

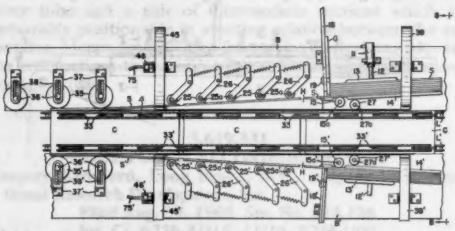
A process for the production of plane three-ply materials for plane building components, which materials consist of a relatively thick inner ply of a thermoplastic and relatively thin outer plies of another thermoplastic. The process comprises preparing a board of polyethylene by means of a screw extruder at elevated temperature and covering the board on both sides with a film of a terpolymer at elevated temperature by means of a pair of rollers to form a sandwich assembly. The terpolymer must have a specific chemical composition; it is prepared from (1) a predominant amount of ethylene, (2) a relatively low amount of an ethylenically unsaturated carboxylic acid and (3) a relatively low amount of an ester of an ethylenically unsaturated carboxylic acid.

3,619,321

APPLICATION OF FACINGS TO CORES

Raymond H. Lewis, Fort Lauderdale, and Donald J. Peters, Boca Raton, both of Fla., assignors to Roberts Consolidated Industries, Inc., Industry, Calif.

Filed Sept. 11, 1968, Ser. No. 759,072
Int. Cl. B32b *31/12*; B05c *1/14*
U.S. Cl. 156—249 **8 Claims**



A machine and method for continuously applying thermoplastic adhesive, in the form of a flexible nontacky spread in a solid state, while mounted on a carrier, to an advancing core to which a facing is to be affixed. The adhesive spread is initially moved past a heating unit, as is each facing, to (1) preheat the facing and (2) liquify the adhesive. The spread of adhesive is then transferred to the core and separated from its carrier in so doing. Thereafter, the facing is advanced to a position against the adhesive spread where it is maintained under a continuing pressure to permit cooling and solidification of the adhesive for permanent union with both the core and facing applied thereto.

3,619,322

PROCESS FOR BONDING FELTS, NEEDLED FELTS, FELT-LIKE MATERIALS AND SIMILAR PRODUCTS

Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland

Filed May 31, 1967, Ser. No. 642,496
Claims priority, application Germany, May 31, 1966, V 31161
Int. Cl. B32b *31/00*
U.S. Cl. 156—282 **19 Claims**

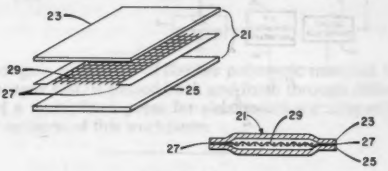
The present disclosure relates to a process and apparatus for bonding felts or feltlike materials which comprises adding to the materials to be bonded a synthetic bonding fiber thereby forming a fiber blend and fuse-bonding the fiber blend by heat-treating said blend to the sticking or melting point of the bonding fibers and setting the fiber blend by cooling down the bonded fibers, said heat-treatment and cooling down stages being effected shocklike by passing at least part of the heating and cooling treatment medium through the material being treated.

3,619,323

METHOD OF BONDING SILICONES TO SILICONES

Leo F. Stebleton, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 6, 1968, Ser. No. 773,819
Int. Cl. B29h *7/04*
U.S. Cl. 156—292 **9 Claims**



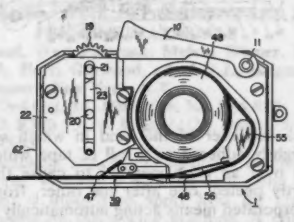
A cured silicone can be bonded to itself or to other cured silicones without the use of primers or materials requiring curing by means of a fusible silicon-containing material, such as a silarylenesiloxane block copolymer. A film or coating of the fusible silicon-containing material can be applied directly to the surfaces to be joined, or a separate film of that material can be placed between the surfaces. Heat is then applied to the fusible material causing it to become tacky and to adhere to the surfaces to be joined when they are pressed together. On cooling of the fusible material, the surfaces are securely bonded together by the fusible material.

3,619,324

MINIATURE LABELING APPARATUS

Yo Sato, Tokyo-to; Sozo Izumihara, Kawaguchi-shi; Haruo Toda, Omiya-shi; Kiyoji Nagashima, Ageo-shi; Eiichi Matsushima, Omiya-shi; Soji Kojima, Kawagoe-shi; Reizo Watanabe, Omiya-shi, and Kiyoshi Someno, Hasuda-machi, all of Japan, assignors to Sato Kiko Kabushiki Kaisha, Tokyo-to, Japan

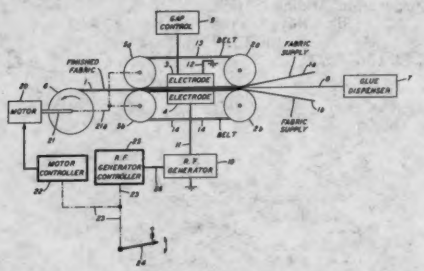
Filed June 26, 1969, Ser. No. 836,901
Claims priority, application Japan, July 3, 1968, 43/45914 Sept. 30, 1968, 43/71028, June 5, 1969, 44/43570, June 7, 1969, 44/44945, June 12, 1969, 44/45760, June 11, 1969, 44/45393, June 10, 1969, 44/45608, Feb. 24, 1969, 44/13775, June 10, 1969, 44/45607, June 4, 1969, 44/43870, 44/43871, June 14, 1969, 44/46535
Int. Cl. B41m *1/40*; B32b *31/20*
U.S. Cl. 156—576 **13 Claims**



A printing mechanism, and a label tape feeding mechanism both actuated by a hand-pushed drive lever, and a roll of

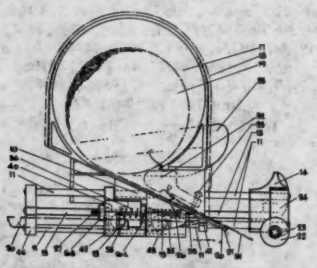
label tape, are enclosed within a compact case, whereby a lightweight labeler is obtained and can be used continuously for a long period without fatiguing the user.

3,619,325
SEALING TEMPERATURE CONTROL APPARATUS FOR CONTINUOUSLY FED SHEET MATERIAL
George R. Hair, Clifton, N.J., and John G. Nielsen, Wantagh, N.Y., assignors to Bondit Corp, Newark, N.J.
Filed Mar. 12, 1969, Ser. No. 806,542
Int. Cl. B29c *27/04*, *27/10*; G05g *15/06*
U.S. Cl. 156—380 4 Claims



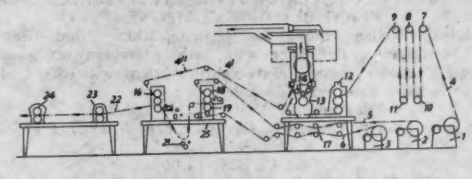
Apparatus for joining sheet material is disclosed in which the material to be joined is fed from supply rolls, a dry monofilament adhesive is interfed between the materials in the area thereof to be joined, the materials and the interfed adhesive are then concurrently compressed and subjected to radio frequency heating energy whereby the adhesive melts and covers the sheet areas to be joined. The heating energy applied to the adhesive is controllably varied with the rate of travel of the material so that the adhesive is heated to the proper temperature regardless of the speed of operation of the machine.

3,619,326
DISPENSERS FOR TAPE-CONVEYED ARTICLES SUCH AS LABELS
Kenneth Burbidge, 73 Hastie Ave., Mangere Bridge, Manakau, New Zealand
Filed Apr. 16, 1968, Ser. No. 721,856
Claims priority, application New Zealand, Apr. 17, 1967, 148051
Int. Cl. B32b ; B41m
U.S. Cl. 156—384 24 Claims



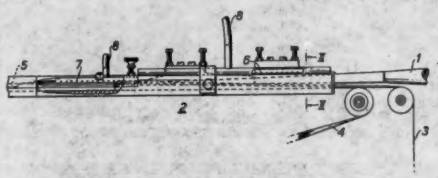
In a label dispenser of the kind in which self-adhering labels are lightly adhered to a roll of tape which is drawn step-by-step over an edge member to cause the labels to become partly peeled, one after the other, from the tape, there is incorporated means acting automatically to compensate for any slackness that may develop in the tape as a result of a label being plucked therefrom, thus ensuring accuracy of delivery.

3,619,327
PACKAGING PRODUCTION
Auguste Tricollet, 395, Rue Paradis, Marseilles, France
Filed May 9, 1969, Ser. No. 826,060
Int. Cl. B41m *1/26*
U.S. Cl. 156—384 2 Claims



The invention provides a machine for the assembly of three strip materials into a multiple-layer packaging or wrapping material. A top layer strip is fed to a printing machine. An intermediate layer strip of, for example, metal foil is fed to a corrugation machine, and the corrugated layer is fed with a backing strip to a gumming machine which unites them. Then the printed layer and the united intermediate and backing layers are fed to a gumming machine which assembles them. The multiple-layer product can be fed to a cutter and divider.

3,619,328
APPARATUS FOR APPLYING ADHESIVE TO CONTINUOUS WEBS
Edward George Preston; Rolf Penzias, and Horace Alexander Stone, all of Deptford, London, England, assignors to Molins Machine Company Limited, London, England
Filed July 8, 1968, Ser. No. 743,236
Claims priority, application Great Britain, July 17, 1967, 32,791/67
Int. Cl. B31f *1/00*; A24c *5/24*
U.S. Cl. 156—461 8 Claims



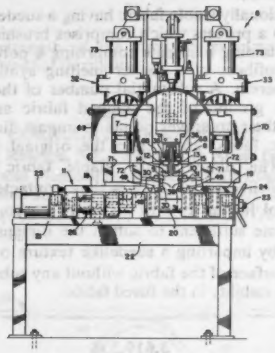
In a cigarette filter-plug rod-making apparatus in which filter material is continuously wrapped in a garniture to form a continuous rod, adhesive is applied to the wrapper web before it enters the garniture at a metered rate either by a pasting wheel for starch or by a gun for polyvinyl acetate.

3,619,329
EXTRUSION APPARATUS FOR THE PREPARATION OF WALLED STRUCTURES
Donald R. Wright, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 28, 1969, Ser. No. 803,348
Int. Cl. B29d *27/00*
U.S. Cl. 156—500 7 Claims

A lightweight plastics extruder is disclosed which can be used with particular benefit in the preparation of structures

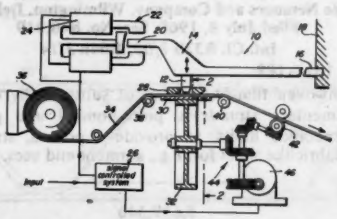
wherein a foamable plastic is extruded in a desired location and the extruder moved as foam material is deposited.

3,619,330
ADJUSTABLE CLAMP USED IN A TUBE SPLICING MACHINE
Glenn D. Kerr, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 25, 1970, Ser. No. 14,101
Int. Cl. B29h *15/04*; G03d *15/04*
U.S. Cl. 156—503 20 Claims



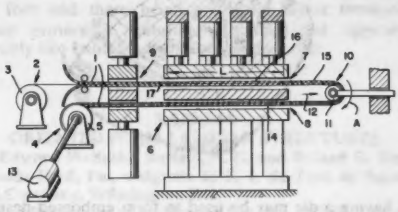
A machine for splicing unvulcanized inner tubes. The machine employs a clamp which is adjustable for holding various size inner tubes. The clamp has a pair of end sections with configured recesses for receiving opposing edges of the inner tube and a pair of intermediate sections which are removably positionable in abutting relation between the end sections. Means are provided for varying the spacing between the end sections to accommodate different intermediate sections.

3,619,331
CODE PUNCH RECORDING SYSTEM
Gregory Grosbard, Long Beach, N.Y., assignor to International Research Development, Inc.
Filed Aug. 29, 1969, Ser. No. 854,126
Int. Cl. B32b *31/18*, *31/10*; B26f *1/00*
U.S. Cl. 156—510 10 Claims



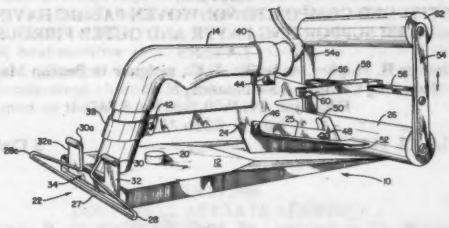
Portions of magnetic tape are transferred to data processing cards by a code punching device. The tape is fed past the punch closely spaced from the card in response to a signal input causing reciprocation of the punch thereby transferring punched out portions of the tape to the cards. A pressure activated adhesive coating the cards firmly holds the punched out tape portions on the cards.

3,619,332
SYSTEM FOR CURING ELONGATE WORKPIECES
Hendrikus Johannus Bongers, Huls, Krefeld, Germany, assignor to G. Siempelkamp & Co., Krefeld, Rhld., Germany
Filed July 25, 1968, Ser. No. 747,506
Claims priority, application Germany, July 25, 1967, P 17 04 999.9
Int. Cl. B30b *15/34*; B32b *31/00*
U.S. Cl. 156—583 4 Claims



An elongate workpiece of flexible polymeric material, such as a conveyor belt, is passed back and forth through different stages of a multiplaten press for simultaneous curing of two or more sections of this workpiece.

3,619,333
APPARATUS FOR APPLYING HEAT BOND TAPE TO ADJACENT CARPET SECTIONS
Donald H. Mender, 8500 West 106th Ave., Broomfield, Colo.
Filed Mar. 17, 1969, Ser. No. 807,521
Int. Cl. B30b *15/34*; B32b *31/08*; B65h *21/00*
U.S. Cl. 156—583 6 Claims

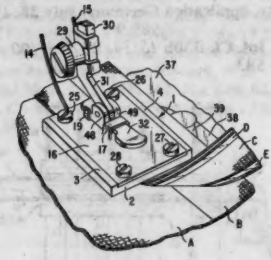


Attachment apparatus for a manually moveable heated carpet seaming iron of the type which melts an adhesive on one face of a seaming tape, characterized by a tape guide secured to the forward end of the iron which aligns the longitudinal central axis of the tape beneath the seam to be formed, pile guides disposed rearwardly of the guide which press the carpet edges downwardly and into abutting relation, and a trailing presser roll for applying pressure to the carpet and forcing it into contact with the melted adhesive.

3,619,334
SEWING MACHINE ATTACHMENT FOR HOT PRESSING MATERIALS
Robert C. Hauf, West Paterson; Melvin Wiener, Rockaway, and John A. Herr, Garwood, all of N.J., assignors to The Singer Company, New York, N.Y.
Filed Oct. 15, 1969, Ser. No. 866,529
Int. Cl. B30b *15/34*; B32b *31/20*; D05b *29/12*
U.S. Cl. 156—583 4 Claims

A sewing machine attachment having a heating element enclosed therein, whereby a material contacting surface of the attachment is utilized to apply heat for hot pressing materials disposed on the sewing machine. A clip arrangement permits the attachment to either be mounted on a presser foot with the material contacting surface facing downwardly, or mounted on a modified throat plate with the

material contacting surface facing upwardly. When the attachment is mounted in the latter position, a special presser



foot having a die may be used to form embossed designs on the materials.

3,619,335

UNITARY LAMINATE

Thomas Toplica Bryan, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 21, 1969, Ser. No. 818,046
Int. Cl. B32b *7/06, 27/06*
U.S. Cl. 161—1 **15 Claims**

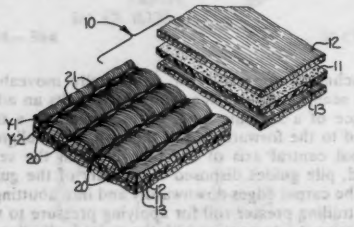
A unitary laminate is shown comprising a backing layer and flexible polymeric film. The film includes as a plasticizer a nonionic surfactant. In a preferred embodiment, the flexible polymeric film is adhered to the backing layer by an intermediate adhesive layer.

3,619,336

STITCHED COMPOSITE NONWOVEN FABRIC HAVING FOAM SUPPORTING LAYER AND OUTER FIBROUS LAYERS

George H. Hughes, Asheville, N.C., assignor to Beacon Manufacturing Company, Swannanoa, N.C.

Filed. Jan. 19, 1970, Ser. No. 3,745
Int. Cl. B32b *7/08*
U.S. Cl. 161—50 **5 Claims**



A stitched, composite, integrated, multilayer nonwoven fabric adaptable for use as bed coverings, garments and the like and specifically characterized by improved hand, drapability, compressibility, resilience, washability, bulk, strength and insulating qualities. The fabric comprises a supporting layer of three-dimensional, compressible, resilient, cellular, resinous foam material having an integral network extending in random directions to define a multiplicity of cells; upper and lower three-dimensional, self-sustaining facing layers of nonwoven textile fibers superimposed on opposite sides of and being contiguous with the supporting layer to completely cover the supporting layer and form the multiple-layer fabric having outer faces with textile fiber characteristics; and elongate, spaced-apart rows of stitches penetrating the superimposed layers for stitch-bonding together the individual fibers of each of the facing layers and for stitch-bonding together the superimposed layers to form the composite fabric. The resulting composite nonwoven fabric may include napped and/or ribbed outer surfaces to provide desired characteristics.

3,619,337

DIMENSIONALLY STABLE FABRIC HAVING A SUEDELIKE TEXTURE

Gene C. Weedon, Richmond; Robert C. Winckhofer, Richmond, and George H. Collingwood, Hopewell, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 15, 1968, Ser. No. 752,739
Int. Cl. D03d *27/00;* **D04h** *11/00*
U.S. Cl. 161—64 **6 Claims**

A dimensionally stable fabric having a suedelike texture is produced by a process which comprises brushing or napping a fabric containing filaments comprising a polyamide matrix having microfibers of a higher melting synthetic polymer dispersed therein. A substantial number of the filaments of the base or ground of the napped fabric are then fused together at their crossover points to impart dimensional stability to the fabric and retain the original fabriclike appearance. The dimensionally stable fabric retaining its original fabriclike appearance is then contacted with an alkylene glycol having two to about 10 carbon atoms for a period of time sufficient to soften the dimensionally stable fabric thereby imparting a suedelike texture on the brushed or napped surface of the fabric without any substantial loss of dimensional stability in the fused fabric.

3,619,338

GLASS FABRIC SHEETS BONDED TOGETHER WITH POLYISOCYANURATES PREPARED FROM AN ORGANIC DIISOCYANATE AND A MONOISOCYANATE USING IONIC POLYMERIZATION CATALYSTS

Lucius G. Gilman, Wakefield, and Morton H. Gollis, Brookline, both of Mass., assignors to Monsanto Research Corporation, Saint Louis, Mo.

Continuation of application Ser. No. 234,513, Oct. 31, 1962, now abandoned , which is a continuation-in-part of application Ser. No. 845,593, Oct. 12, 1959, now abandoned. This application May 14, 1968, Ser. No. 733,190
Int. Cl. B32b *17/10*
U.S. Cl. 161—93 **2 Claims**

Polyisocyanurates made by reacting diisocyanates and monoisocyanates, process for making the polyisocyanurates using ionic polymerization catalysts, and laminates made fusing the polyisocyanurates as laminating resins.

3,619,339

POROUS NONWOVEN FILM-FIBRIL SHEET AND PROCESS FOR PRODUCING SAID SHEET

William Lee Garrett, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 8, 1969, Ser. No. 840,049
Int. Cl. B32b *7/00;* **D04h** *3/14*
U.S. Cl. 161—109 **10 Claims**

A nonwoven film-fibril sheet of substantially continuous plexifilamentary strands is point-bonded and perforated, within specified limits, to provide a porous, strong, nonpapery fabriclike sheet for, e.g., garment end uses.

3,619,340

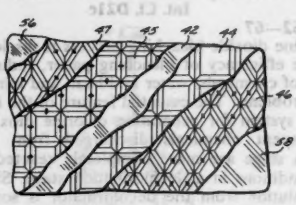
MULTILAYERED THERMAL INSULATION MATERIAL

Peter Jones, 2211 Verde Oak Drive, Hollywood, Calif.

Filed Jan. 21, 1969, Ser. No. 792,378
Int. Cl. B32b *3/00, 3/10*
U.S. Cl. 161—127 **7 Claims**

This invention relates to improvements in multilayered thermal insulation employing heat reflectivity in multiple layers of flexible, embossed, reflective material or of reflectively coated materials which are themselves heat insulators. The several layers are arranged in series and are embossed to

define spaced, substantially dead, air cells. The walls of successive layers of cells are offset one from the other whereby



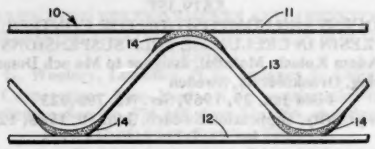
compressive strength of the structure is maintained while providing substantial flexibility.

3,619,341

CORRUGATED FIBERBOARD

Curtis Elmer, Raleigh, N.C., assignor to Alton Box Company, Alton, Del. and Monsanto Company, Saint Louis, Mo.

Filed July 18, 1969, Ser. No. 843,106
Int. Cl. B32b *3/28, 27/42;* C08a *37/16*
U.S. Cl. 161—133 5 Claims



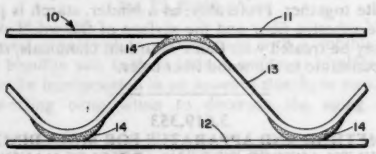
Corrugated fiberboard which resists deterioration in strength when in the presence of moisture or water, and intermediate resin treated medium and liner sheet members useful in the manufacture thereof. Such board is made by treating medium and, optionally, liner members with a modified phenol aldehyde resole resin composition and thereafter bonding corrugated medium to liner members with a thermosetting resorcinol-starch-formaldehyde adhesive system.

3,619,342

CORRUGATED FIBERBOARD

William D. Burke, West Springfield, Mass., assignor to Alton Box Board Company, Alton, Del. and Monsanto Company, Saint Louis, Mo.

Filed July 18, 1969, Ser. No. 843,125
Int. Cl. B32b *3/28, 27/42;* C08g *37/16*
U.S. Cl. 161—133 5 Claims



Corrugated fiberboard which resists deterioration in strength when in the presence of moisture or water, and intermediate resin treated medium and liner sheet members useful in the manufacture thereof. Such board is made by treating medium and, optionally, liner members with a modified phenol aldehyde resole resin composition and thereafter bonding corrugated medium to liner members with the phenol aldehyde resole resin used as the waterproofing agent in a starch adhesive.

3,619,343

ROOFING MATERIAL

Clarence S. Freeman, P.O. Box 1204, Beaumont, Tex.

Filed Apr. 23, 1969, Ser. No. 818,778
Int. Cl. B32b *5/02, 5/16*
U.S. Cl. 161—160 15 Claims

An expanded plastic roof product having a first layer of open cell expanded material, the material being preferably a polyolefin on density from about 1 to about 25 pounds per cubic foot and there being additional layers thereon for weather protection, coloration, styling and appearance preferably like that of current roofing materials.

3,619,344

ORIENTED FOAM LAMINAR STRUCTURES

Leon Edward Wolinski, Buffalo, N.Y., and Roland G. Harris, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 767,093, Oct. 14, 1968, now abandoned. This application Aug. 7, 1969, Ser. No. 848,206
Int. Cl. B32b *3/12*
U.S. Cl. 161—161 17 Claims

A laminar structure comprising oriented foam having thermoformable thermoplastic film bonded to the surfaces thereof and process for its preparation.

3,619,345

HEAT-SENSITIVE STENCIL PAPER

Keishi Kubo, Kanagawa-ken; Kiyoshi Sakai, Tokyo, and Kenzi Itoh, Tokyo, all of Japan, assignors to Habushiki Kaisha Ricoh, Tokyo, Japan

Filed June 24, 1969, Ser. No. 836,171
Claims priority, application Japan, June 28, 1968, 43/44526
Int. Cl. B41c *1/14;* B41m *1/12;* B44d *3/30*
U.S. Cl. 161—162 2 Claims

A heat-sensitive stencil paper consisting of a porous thin paper (Stencil base tissue) laminated to a vinylidene chloride-vinyl chloride copolymer film and a powder layer formed on the surface of said film.

3,619,346

POLYVINYL ACETATE ADHESIVE

Stanley R. Sandler, Springfield, Pa., assignor to The Borden Company, New York, N.Y.

Filed Nov. 20, 1967, Ser. No. 684,536
Int. Cl. B32b *27/30;* C08g *51/24*
U.S. Cl. 161—251 8 Claims

This invention relates to vinyl acetate polymer adhesives which are room temperature curable under acidic conditions and more particularly to aqueous adhesives curable at room temperature comprising a vinyl acetate polymer, an N-hydroxymethyl reactive monomer copolymerizable with said polymer, an acidic curing agent, and a volatile curing inhibitor selected from the group consisting of substituted and unsubstituted C_1–C_5 aliphatic primary alcohols having a boiling point below about 150° C.

3,619,347

RECOVERY OF WASTEPAPER TREATED WITH UREA OR THE LIKE RESINS TO IMPART WET STRENGTH

Glen V. Ireland, Jr., Brookfield, Wis., assignor to Salvox Mfg. Company, Milwaukee, Wis.

Filed Mar. 13, 1969, Ser. No. 807,064
Int. Cl. D21c *5/02*
U.S. Cl. 162—5 6 Claims

Wastepaper treated typically with urea resins or the like to impart high wet strength is recovered by treating it in a standard paper pulper in an aqueous medium with a mixture of sulfuric and phosphoric acid and, advantageously, an emulsifying agent.

3,619,348

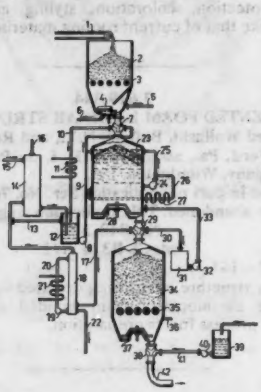
PROCESS FOR CONTINUOUS CELLULOSE COOKING

Arne Johan Arthur Asplund, Lidingo; Karl Nicolaus Cederquist, Nasbypark, and Rolf Bertil Reinhall, Lidingo, all of Sweden, assignors to Defibrator Aktiebolag, Stockholm, Sweden

Continuation-in-part of application Ser. No. 543,713, Apr. 19, 1966, now abandoned. This application Sept. 5, 1969, Ser. No. 857,295

Int. Cl. D21c 3/26

U.S. Cl. 162—19 12 Claims



The invention provides an apparatus and method for producing cellulosic pulp. A downwardly moving column of cellulosic material is contacted with a countercurrent flow of steam in a steaming zone. The steaming zone is maintained at an atmospheric pressure and temperature effective to expel air from the material without causing discoloration thereof. The temperature may be from 100° C. to 120° C. The steamed material is preimpregnated in a zone which is sealed from the ambient air. The preimpregnation is effected by contacting the steamed material with cold liquor having a temperature below that of the steamed material and effective to produce a rapid absorption of liquor therein. The cold liquor temperature is in the range of about 20° C. to about 80° C., and pressures of up to 10 gauge pressures can be employed. A condensate material resulting from the steaming treatment is separated from the cellulosic material after it has been subjected to the steaming treatment. The preimpregnated cellulosic material is sluiced through an impregnating zone containing hot cooking liquor at a temperature and superatmospheric pressure sufficient to effect impregnation thereof. The temperature within the impregnating zone may range from 100° C. to 180° C. and increase in the direction of material movement. The impregnated material is then passed from the impregnating zone for subsequent introduction into any desired pulp vapor phase digesting zone. The disclosed apparatus is used to effect the various process steps of the overall treatment.

3,619,349

BLEACHING OF SHREDDED OR FLUFFED CELLULOSIC PULP WITH GASEOUS CHLORINE MONOXIDE

Norman Liebergott, Chomedy, and Henry Irving Bolker, Pointe Clare, Quebec, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Dec. 8, 1969, Ser. No. 882,819

Claims priority, application Great Britain, Dec. 16, 1968, 59,738/68

Int. Cl. D21c 9/12

U.S. Cl. 162—66 17 Claims

A process for bleaching a fibrous cellulosic pulp which comprises bleaching the pulp at high consistency and in the form of fluffed or shredded fibers and fiber aggregates with chlorine monoxide in the gaseous phase.

3,619,350

CHLORINE DIOXIDE PULP BLEACHING SYSTEM

Richard Marchfelder, 159-A Lake Ave., Greenwich, Conn.

Filed July 11, 1969, Ser. No. 840,927

Int. Cl. D21c

U.S. Cl. 162—67 5 Claims

A chlorine dioxide bleaching process is disclosed that improves the efficiency of bleaching paper, reduces the consumption of chemicals, water and heat, and minimizes waste disposal problems. The essential feature of the invention is a two-stage system for generating chlorine dioxide in which partially spent chemicals discharged from the primary generation stage are more completely reacted under controlled conditions in a dechlorination stage. Since chlorine dioxide solution from the dechlorinator is somewhat contaminated, it is separately collected for use in the early pulp chlorination stages while the purer chlorine dioxide from the primary generator is reserved for use in the latter stages of pulp bleaching. The chloride content and corrosiveness of the spent reagents are minimized by this process which not only provides for economical utilization of the chemicals but also makes it feasible to add the underflow from the dechlorinator to the black liquor recovery system and so increase the recovery of sulfides. Waste disposal problems and the consumption of water are minimized by recycling free acid from the dechlorinator to the generator and by utilizing the filtrate from the last stages of pulp washing as the absorption media in the chlorine dioxide absorption towers.

3,619,351

PROCESS AND COMPOSITION FOR CONTROL OF RESIN IN CELLULOSE PULP SUSPENSIONS

Frans Adam Kolosh, Molndal, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Jan. 29, 1969, Ser. No. 795,023

Claims priority, application Sweden, Jan. 30, 1968, 1239/68

Int. Cl. D21c 3/20

U.S. Cl. 162—72 14 Claims

Process and composition for controlling resin in aqueous cellulose pulp suspensions which comprises incorporating in the suspension a resin control agent comprising a water-soluble nonsurface-active cationic quaternary ammonium salt.

3,619,352

FLAME RETARDANT HARDBOARD AND ITS MANUFACTURE

Donald Alfred Bell, Holmcroft, Athy, Ireland, assignor to Bowaters United Kingdom Paper Company Limited, London, England

Filed July 18, 1968, Ser. No. 745,706

Claims priority, application Great Britain, July 26, 1967, 34,299/67

Int. Cl. D21h 1/02

U.S. Cl. 162—127 3 Claims

A process of manufacturing flame retardant hardboard which includes forming, in continuous manner, a travelling layer of wet wood fiber, continuously forming on a surface of said wood fiber layer as it advances, a layer comprising wet asbestos fiber and wood pulp, and subsequently removing water from the two layers whereby the two layers combine and unite together. Preferably, as a binder, starch is present with the asbestos fiber and the surface of the wood-asbestos layer may be treated with flame retardant chemicals, some of which penetrate to the wood fiber layer.

3,619,353

METHOD AND APPARATUS FOR MOULDING MULTILAYERED FIBROUS ARTICLES HAVING LAYERS OF DIFFERENT FIBROUS MATERIALS

John Covington Williams, Meriden, Conn., assignor to AMF Incorporated

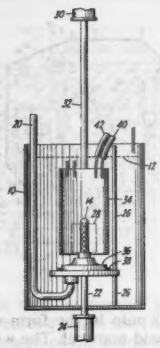
Filed Sept. 20, 1968, Ser. No. 761,068

Int. Cl. D21j 7/00

U.S. Cl. 162—129 7 Claims

Apparatus and method for pulp moulding a fibrous article including a tank containing a first slurry of fibrous material, a foraminous die connected to a rod and cylinder for moving the die into and out of the first slurry in the tank on which the article is formed, a sleeve connected to a rod and

cylinder for moving the sleeve into and out of the first slurry in the tank, the sleeve functioning to isolate the die from the first slurry in the tank, and hoses connected to the sleeve for



supplying a second slurry of fibrous material to the area between the sleeve and the die in order that the accreted product be composed of layers of varying fiber constituents.

3,619,354

LAMINATED FELTED SHEETS AND ASBESTOS CONTAINING COATING COMPOSITION FOR USE THEREIN

Robert G. Woolery, Lewiston, N.Y., assignor to Union Carbide Corporation, New York, N.Y., continuation-in-part of application Ser. No. 576,248, Aug. 31, 1966, abandoned

Filed Feb. 5, 1969, Ser. No. 796,913
Int. Cl. B32b *5/08, 19/06;* D21h *5/18*
U.S. Cl. 162—129 3 Claims

Disclosed is a process for forming laminated felted sheets wherein a wet base sheet of fibrous material is formed on a paper making screen and, before the wet base sheet is removed from the screen, a nonseparable, uniform asbestos-binder composition is applied thereto. The composition comprises an intimitate mixture containing (a) at least 50 percent by weight of chrysotile asbestos having a specific surface area from about 60–80 $m^2/g.$, a magnetite content of from about 0.04–0.5 percent, a reflectance of from about 72–78 percent, and a pulpability such that 0.2–1 percent of the asbestos is retained on a 65 mesh Tyler screen and (b) a binder therefore. The ratio of asbestos to binder, on a dry weight basis, ranges from about 3:1 to 9:1.

3,619,355

METHOD FOR DECREASING AGING OF PAPER WITH SULFITES AND/OR BISULFITES AND PRODUCT

Richard A. Silberman, Ridgefield, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sept. 7, 1967, Ser. No. 665,955
Int. Cl. D21h *1/10*
U.S. Cl. 162—135 3 Claims

A dried paper web is impregnated with a soluble sulfite and/or bisulfite salt, such as sodium sulfite or bisulfite which salt may be incorporated in an aqueous starch, or starch clay, surface-sizing composition to decrease the aging of the paper.

3,619,356

FIXING OF ANIONIC DYESTUFFS TO CELLULOSIC FIBERS WITH CATIONIC POLYMERIC FATTY ACID POLYALKYLENE POLYAMINES

James L. Keen, New Brighton, Minn., assignor to General Mills, Inc.

Filed Mar. 25, 1968, Ser. No. 715,544
Int. Cl. D21h *3/80*
U.S. Cl. 162—162 17 Claims

Cellulosic fibers are dyed by treatment with an anionic dye such as Calcocid Blue 2G (a tri-phenyl methane dye, color Index 42090) and a polyamine derived from polymeric fat acids such as the polyamine obtained by hydrogenating, in the presence of ammonia, the reaction product of ammonia and tall oil fatty acids. Paper is prepared by adding such dye and polyamine to the aqueous fiber dispersion prior to the formation of sheets.

3,619,357

PROCESS OF DYEING CELLULOSIC FIBERS WITH MONTMORILLONITE CLAY AND A POLYMERIZED FATTY NITROZEN COMPOUND AND PRODUCTS OBTAINED THEREBY

James L. Keen, New Brighton, Minn., assignor to General Mills, Inc.

Filed Mar. 25, 1968, Ser. No. 715,549
Int. Cl. D21h *3/80*
U.S. Cl. 162—162 17 Claims

Cellulosic fibers are dyed by treatment with an anionic dye, such as Nigrosine 02P or OPX, color index 5420, an alkali metal or acid montmorillonite clay such as bentonite, and a fatty nitrogen compound, prepared from polymerized fat acids, such as tallow diamine. Paper is prepared by adding the dye, clay and fatty amine or quaternary ammonium compound to the aqueous dispersion prior to the formation of sheets therefrom.

3,619,358

METHOD FOR IMPROVING WATER DRAINAGE FROM A PAPER WEB ON A WIRE-SCREEN OF A PAPER MACHINE BY USING A MODIFIED POLYACRYLAMIDE PREPARED FROM A WATER-SOLUBLE POLYACRYLAMIDE BY THE HOFFMAN REACTION

Ten Yoshii, Akashi-shi; Shigehiko Yoshioka, Kobe-shi; Hazimu Hashimoto, Akashi-shi; Iwao Sugiyama, Akashi-shi, and Tsuruo Okada, Tokyo, all of Japan, assignors to Seiko Kagaku Kogyo Company, Limited, Akashi-shi, Hyogo-ken, Japan

Filed June 5, 1969, Ser. No. 830,845
Claims priority, application Japan, June 12, 1968, 43/40373
Int. Cl. D21h *3/58*
U.S. Cl. 162—168 2 Claims

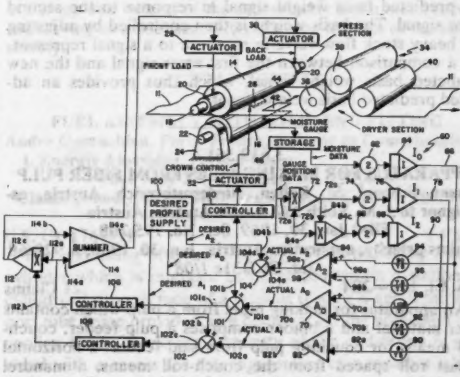
The sheeting or paper web forming operation in a paper making process, can be facilitated by addition to a pulp stock, of a modified polyacrylamide prepared from a water-soluble polyacrylamide by the Hoffmann reaction.

3,619,359

GROSS MACHINE MOISTURE CONTROL SYSTEM FOR THE NET END OF A PAPER MACHINE

Marion A. Keyes, IV, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 10, 1969, Ser. No. 805,642
Int. Cl. D21f *3/06*
U.S. Cl. 162—252 12 Claims



This invention relates to wet end moisture control utilized in the making of a continuous web of paper. An on line cross

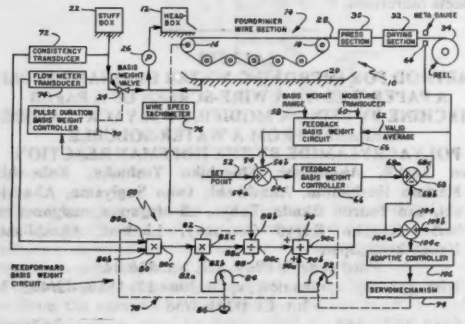
machine moisture profile is obtained and this profile is automatically adjusted by appropriately changing the relative contributions of a plurality of control actuators so that the profile is made to conform more accurately to a desired shape prior to entering the dryer section of the paper making machine. A scanning moisture gauge traverses the web between a press roll section and the dryer section. From this scan, a continuous moisture profile is stored from which the gross moisture level, skew, and curvature of the profile are computed. From gross moisture level, skew, and curvature signals, the control actuators simultaneously apply controlled amounts of pressure to the ends and center of the press rolls to bring the continuous moisture profile to a desired profile.

3,619,360

BASIS WEIGHT CONTROL SYSTEM FOR A PAPERMAKING MACHINE

Spencer R. Persik, Jr., Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 17, 1968, Ser. No. 784,335
Int. Cl. D21f *1/08*
U.S. Cl. 162—258 **5 Claims**



A system for controlling the final basis weight of a paper web by adjusting the amount of heavy fiber stock supplied to a Fourdrinier Machine headbox in response to an adjusted predicted basis weight signal. Such signal is based on comparisons between the actual basis weight of the paper web downstream of the drying section, a desired basis weight signal input, and a predicted basis weight signal derived from the consistency of heavy stock, its rate of flow, and the speed of the paper web forming section. Means are provided for comparing the actual basis weight signal with a desired basis weight signal input to provide a first error signal. A second error signal is generated by comparing the feedforward predicted basis weight with the actual basis weight signal. A new predicted basis weight signal is then produced by adjusting the predicted basis weight signal in response to the second error signal. The basis weight is then controlled by adjusting the heavy stock flow valve in response to a signal representing a comparison between the first error signal and the new predicted basis weight signal, which thus provides an adjusted predicted basis weight signal.

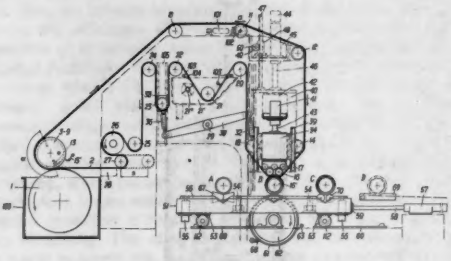
3,619,361

APPARATUS FOR MAKING PIPES FROM FIBER PULP

Johann Schoggl, St. Rolten, Niederosterreich, Austria, assignor to J. M. Voith AG, Lower Austria, Austria

Filed Jan. 30, 1969, Ser. No. 795,208
Claims priority, application Austria, Jan. 30, 1968, A 920/68
Int. Cl. B31c *1/08*
U.S. Cl. 162—284 **21 Claims**

An apparatus for making pipes from a pulp which contains fiber material and a binder comprises a pulp feeder, couch-roll means for couching pulp from said feeder, a horizontal breast roll spaced from the couch-roll means, a mandrel detachably supported on the top of said breast roll, pressure-roll means arranged to urge said mandrel against said breast roll, and an endless felt blanket, which is trained over said couch-roll means and is mounted on support means to pass between said pressure-roll means and said mandrel and to pass from said pressure-roll means extends back to said couch-roll means out of contact with said breast roll. The



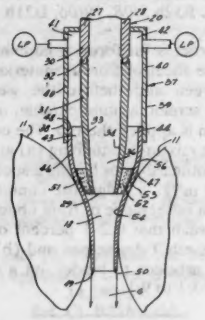
blanket transfers said pulp in the form of a web from said couch-roll means to said mandrel. The web is wound around the mandrel in a tubular form to form the desired pipes.

3,619,362

PAPERMAKING HEADBOX STOCK NOZZLE WITH LIQUID JACKET MEANS FOR ELIMINATION OF STOCK EXPOSURE TO AIR

Joseph D. Parker, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 3, 1969, Ser. No. 796,090
Int. Cl. D21f *1/00*
U.S. Cl. 162—301 **7 Claims**



A twin wire paper forming machine including a headbox having a stock outlet nozzle for directing a stream of stock into the forming nip of the machine. A liquid jacket means disposed on opposite sides of the stock nozzle discharges a stream of liquid into contiguous relation with the stock stream between the outlet of the stock nozzle and the nip to prevent exposure of the stock to ambient air. The stock outlet nozzle comprises wall members which include stationary and moveable portions, the area between the moveable portion of the outlet nozzle and the liquid jacket means varying as a function of the stock pressure in the outlet nozzle and liquid pressure in the liquid jacket means.

3,619,363

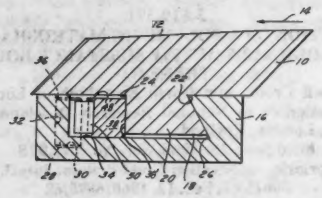
BLADE ASSEMBLY FOR PAPER-MAKING MACHINES

Perry O. Pherson, West Suffield, Conn., assignor to A. P. Wagenknecht Co., Inc., Thompsonville, Conn.

Filed Sept. 30, 1969, Ser. No. 862,348
Int. Cl. D21g *9/00*
U.S. Cl. 162—352 **2 Claims**

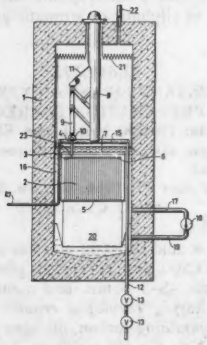
An assembly to be used for foil blades, flat top deflector blades, forming board blades and other replacable wear strips which span a papermaking machine providing quick blade removal while the machine is in the operating as well as nonoperating condition and wherein accurate seating and

firm gripping of the blade is accomplished during normal operation. The base of the blade is positioned within a channel in a support member and held in place by a bar provided with a series of inclined wedge surfaces. Each wedge surface



engages a pin on the support member such that longitudinal motion of the bar creates a transverse, horizontal force which effects fixed engagement of the blade base with the channel wall of the support member.

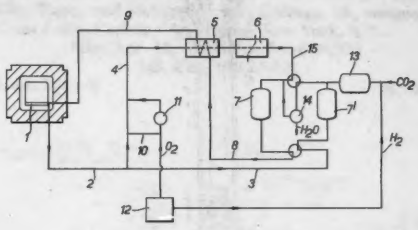
3,619,364
NUCLEAR REACTOR IN WHICH THE COOLANT IS BOILING LIGHT WATER
Peter Heinrich Erwin Margen, Roslags-Nasby, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden
Filed Apr. 11, 1968, Ser. No. 720,690
Claims priority, application Sweden, Apr. 12, 1967, 5121/67
Int. Cl. G21c
U.S. Cl. 176—31 **1 Claim**



In a nuclear reactor of the boiling light water type the steam-water mixture produced in the fuel cartridges is passed through steam-water separators in which the steam is separated from the water. According to an improved embodiment a fuel cartridge is united with a steam-water separator to form a unit. Said unit can be lifted by a refueling machine, so as to be inserted into and removed from the reactor through a refueling tube.

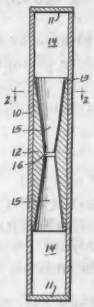
3,619,365
NUCLEAR REACTORS AND COOLANT THEREFOR
Geoffrey Baguley, Croft, Warrington, England, and Daniel A. Shields, San Carlos, Calif., assignors to United Kingdom Atomic Energy Authority, London, England
Filed July 17, 1968, Ser. No. 745,608
Int. Cl. G21c *15/28*
U.S. Cl. 176—38 **4 Claims**

Carbon dioxide for the cooling of a carbon dioxide-cooled, graphite-moderated nuclear reactor is mixed with hydrogen and passed over a catalyst which promotes the reaction between carbon dioxide and hydrogen to produce methane. The hydrogen is obtained by electrolysis of water in plant which may also produce argon-free oxygen for consumption



in a carbon monoxide/oxygen recombination unit, converting carbon monoxide formed in the coolant to carbon dioxide.

3,619,366
FUEL SUBASSEMBLY FOR A NUCLEAR REACTOR
Walston Chubb, Worthington; Donald L. Keller, Columbus; Richard A. Wullaert, Columbus, and Victor W. Storhok, Columbus, all of Ohio
Filed May 6, 1969, Ser. No. 822,211
Int. Cl. G21c *3/18*
U.S. Cl. 176—68 **1 Claim**

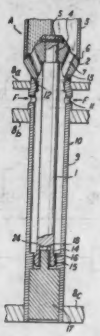


A fuel subassembly for a nuclear reactor incorporating a body of uranium dioxide or mixed uranium-plutonium dioxide fuel within an elongated casing. A gas plenum is located at the top and bottom of the subassembly and a metal tube or rod serving as a heat sink extends along the axis of the subassembly.

3,619,367
FUEL ASSEMBLY WITH SOLID END-FITTING
Andre Gumuchian, Paris, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed May 23, 1968, Ser. No. 731,468
Claims priority, application France, June 6, 1967, 109,346
Int. Cl. G21c *19/10*
U.S. Cl. 176—78 **1 Claim**

The end-fitting of a fuel assembly is constituted by a solid cylinder which is intended to be placed within a stationary cylindrical support tube of a nuclear reactor diagrid, the support tube being provided with openings for the admission of a cooling fluid. The lower extremity of the end-fitting is provided with a recess for the engagement of a member which locks the end-fitting in the support tube. The upper extremity of the end-fitting is attached to a connecting element which is joined to a fuel assembly box containing the fuel pins. The

connecting element is pierced by openings so that the cooling fluid which is admitted into the space formed between the



support tube and the end-fitting can circulate between said space and the interior of the fuel assembly box.

3,619,368

PREPARATION OF A CELLULAR MATERIAL RICH IN PROTEIN

Jan W. Woldendorp, Munstergeleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Oct. 31, 1969, Ser. No. 873,061
Claims priority, application Netherlands, Oct. 31, 1968, 30615/67, Feb. 12, 1968, 6870/68
Int. Cl. C12d *13/00*
U.S. Cl. 195—30 **7 Claims**

A process of preparing protein by cultivating protein-rich Eumycetes, wherein a mixture of aliphatic mono- and dicarboxylic acids with fewer than 8 carbon atoms is used as a carbon source in a culture medium with a pH between 5.5 and 8.

3,619,369

PROCESS FOR PRODUCING XYLITOL BY FERMENTATION

Hiroshi Onishi, and Toshiyuki Suzuki, both of Noda-shi, Japan, assignors to Noda Institute for Scientific Research, Noda-shi, Japan

Filed July 8, 1969, Ser. No. 840,034
Claims priority, application Japan, Oct. 31, 1968, 43/78944
Int. Cl. C12c *1/00*
U.S. Cl. 195—37 **7 Claims**

A process for producing xylitol by fermentation (xylitol is useful as sweetening materials or treating agents of diabetics), which comprises (i) culturing yeasts, for example, Debaryomyces sake (ATCC 20,212) in a culture medium containing glucose so as to produce D-arabitol, (ii) after the sterilization of said culture medium, culturing acetic acid bacteria, for example, Acetobacter suboxydans ATCC 621 therein so as to produce D-xylulose, and further, (iii) with or without separating D-xylulose from said broth, culturing yeasts, for example, Candida guilliermondii var. soya ATCC 20,216 in a culture medium containing the D-xylulose as a sugar source so as to produce xylitol.

3,619,370

MICROBIAL REDUCTION OF THIADIAZOLES

Leonard M. Weinstock, Rocky Hill; Roger J. Tull, Metuchen, and Dennis M. Mulvey, Iselin, all of N.J., assignors to Charles E. Frosst & Co.

Filed Apr. 21, 1969, Ser. No. 818,086
Int. Cl. C12d *13/00*
U.S. Cl. 195—51 **3 Claims**

Process is described for reducing a 3-substituted-4-(3-amino-2-oxopropoxy)-1,2,5-thiadiazole chemically with sodium borohydride or aluminum alkoxide or by use of a bacterial, actinomycetales or fungal reductase to provide a 3-substituted-4-(3-amino-2-hydroxypropoxy)-1,2,5-thiadiazole that exhibits β-adrenergic blocking properties and therefore useful, inter alia, in treatment of angina pectoris.

3,619,371

PRODUCTION OF A POLYMERIC MATRIX HAVING A BIOLOGICALLY ACTIVE SUBSTANCE BOUND THERETO

Eric Mitchell Crook, and Garth Kay, both of London, England, assignors to National Research Development Corporation, London, England

Filed June 26, 1968, Ser. No. 742,978
Claims priority, application Great Britain, July 3, 1967, 30615/67, Feb. 12, 1968, 6870/68
Int. Cl. C07g *7/02*; **A61k** *23/00*
U.S. Cl. 195—63 R **20 Claims**

A polymeric matrix having a biologically active substance chemically bound thereto, which comprises a polymer and a biologically active substance linked by groups of the formula:

where Y represents a nucleophilic substituent that is an amino group, or an aliphatic or aromatic group.

3,619,372

ACID RESISTANT LIPASE AND PROCESS FOR PREPARATION THEREOF

Fumihiko Yoshida; Hiroshi Motai, and Eiji Ichishima, all of Noda-shi, Japan, assignors to Kikkoman Shoyer Co., Ltd., Noda-shi, Japan

Filed June 27, 1966, Ser. No. 560,709
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R **9 Claims**

Lipase which is acid resistant and has an average molecular weight of 43,500 and comprises glutamic acid or glutamine, threonine, –S–S bonds, and mannose. The lipose is prepared by culturing *Torulopsis ernobii ATCC 20000 in a liquid medium containing carbon, nitrogen and other inorganic salt source under an aerobic condition. Vegetable oils or fatty acids may be added to the medium.*

3,619,373

PROCESS FOR MALTING GERMINATED GRAIN

Bernard Dixon, Harpenden, and Alan Arthur Douglas Comrie, Manchester, both of England, assignors to The Enzymic Malt Company Limited, London, England

Filed June 7, 1968, Ser. No. 735,181
Claims priority, application Great Britain, June 8, 1967, 26619/67
Int. Cl. A23i *1/00*
U.S. Cl. 195—70 **4 Claims**

A process of malting for the production of acid malt involving subjecting grain having a low percentage of potential extract (less than 75 percent) to oxygen-free conditions at chitting (rootlet emergence) or at an early stage after chitting. The period of exposure to these conditions is at least 2 days at temperatures of 10° C. to 36° C. and the preferred moisture content of the grain is high (35 to 50 percent). Drying temperatures are low (i.e., below about 55° C.) if normal colored acid malt is needed, but a novel and very highly colored dried acid malt may be obtained if drying is carried on at temperatures above 80° C.

3,619,374

ANTIBIOTIC PRODUCTION UTILIZING STREPTOMYCES REFUINEUS VAR. THERMOTOLERANS

Julius Berger, Passaic; Andrew E. Karr, Bloomfield; Willy Leimgruber, Montclair; Benjamin Tabenkin, Upper Montclair, N.J.; Arno Johannes Schocher, Benken, Switzerland, and Vladimir Stefanovic, Needham, Mass., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 416,599, Dec. 7, 1964, Pat. No. 3,361,742. Filed Dec. 4, 1967, Ser. No. 687,433
Int. Cl. C12d 9/00
U.S. Cl. 195—80 5 Claims

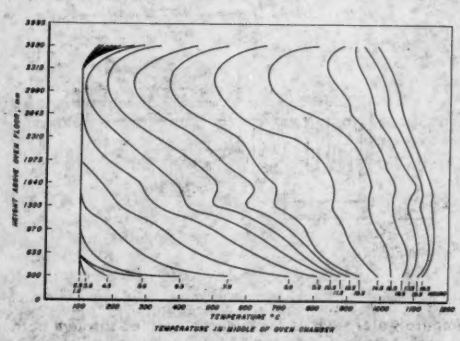
Antibiotics having antitumor and antibacterial activity are produced by fermentation of thermophilic actimomycetes *Streptomyces refuineus* var. *thermotolerans*, having NRRL numbers 3,143 and 3,144, in a nutrient medium containing a protein source and a carbohydrate source, at 35° C. to 55° C., extracting the fermentation broth with a solvent and isolating the active fraction.

3,619,375

PROCESS FOR MAINTAINING TEMPERATURE DIFFERENTIAL IN COKING CHAMBER OF HORIZONTAL COKING OVEN

Victor Gobiet, Wanne-Eickel; Gunther Juranek, Gelsenkirchen, and Heinrich Schurhoff, Essen, all of Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 19, 1969, Ser. No. 808,556
Claims priority, application Germany, Mar. 27, 1968, P 17 71 044.0
Int. Cl. C10b 21/20
U.S. Cl. 201—44 4 Claims



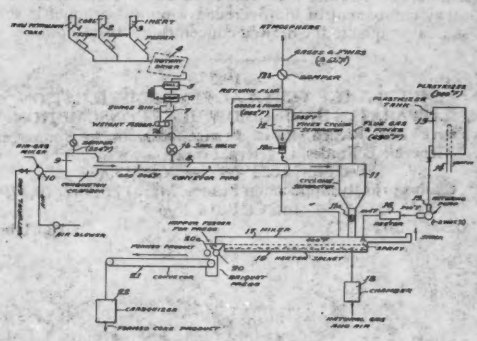
A process and apparatus for increasing the throughput of a horizontal byproduct coke oven. The coal charge in the coking chamber is subjected to a first elevated temperature in the intermediate zone between the top and bottom of the coking chamber. The coal charge in the bottom zone adjacent the base of the coking chamber is subjected to a second elevated temperature that is between 50° C. and 150° C. less than the first elevated temperature in the intermediate zone and the coal charge in the top zone adjacent the top of the coking chamber is subjected to a third elevated temperature that is about 100° C. higher than the temperature of the intermediate zone. With this process, a temperature gradient is maintained in the coal charge during the coking process with the lowest temperature adjacent the bottom and the highest temperature adjacent the top of the coal charge. The temperature gradient is obtained by either varying the thickness of the heating walls, providing high thermal conductivity refractory bricks for the portion of the heating wall adjacent the top of the chamber or modifying the burner arrangement or combustion process in the heating flues.

3,619,376

METHOD OF MAKING METALLURGICAL COKE BRIQUETTES FROM COAL, RAW PETROLEUM COKE, INERT MATERIAL AND A BINDER

Joseph J. Patel, Skokie, Ill.; Frederick L. Shea, Jr., Johnson City, Tenn., and Richard L. Stec, Chicago, Ill., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Apr. 12, 1967, Ser. No. 630,373
Int. Cl. C10b 55/02
U.S. Cl. 201—6 30 Claims



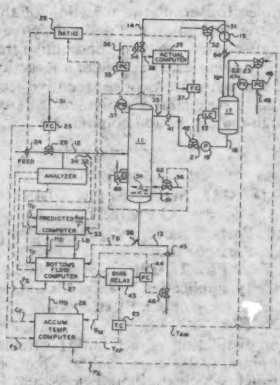
The process comprises: mixing selected carbonaceous particles with a plasticizer; heating the particles and the plasticizer to a suitable temperature; compressing the plasticized particles while they are hot into green bodies of desired shape and specified maximum porosity and minimum density; and carbonizing the formed green bodies, employing a controlled carbonization process. Care it taken to avoid any substantial amount of oxidation of the particles and/or of the formed green bodies during most of the aforesaid heating, pressing and carbonizing steps, particularly while the particles or bodies are at substantially elevated temperatures. Other elements of the process will become apparent from a detailed reading of this specification.

3,619,377

CONTROL OF COMPOSITION OF OVERHEAD VAPOROUS PRODUCT IN A PARTIALLY CONDENSING FRACTIONATION COLUMN

Jim B. Palmer, Bartlesville, Okla., and Dale E. Lupfer, Sweeny, Tex., assignors to Phillips Petroleum Company

Filed Aug. 4, 1969, Ser. No. 847,314
Int. Cl. B01d 3/42
U.S. Cl. 202—160 10 Claims



A multicomponent feed is fractionated in a distillation column to produce an overhead vapor stream, which is then

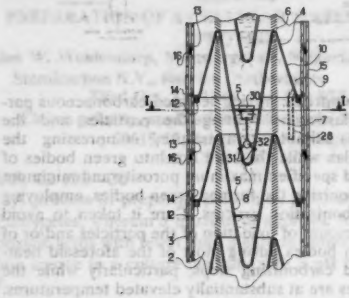
partially condensed and passed to an accumulator to obtain a liquid external reflux stream and an overhead vaporous product stream. The accumulator pressure is maintained substantially constant. A signal representative of the predicted accumulator temperature is established, based on measurements of feed flow rate, feed composition, overhead product specifications, accumulator pressure, and bottoms product flow rate. The predicted accumulator temperature is compared with the measured accumulator temperature to obtain a bias signal. This bias signal is used to manipulate the bottoms product flow rate to effect the adjustment of the accumulator temperature to a value at which the concentration of a key component of the overhead vaporous product is substantially equal to the desired concentration thereof.

3,619,378

MULTISTAGE VERTICAL FLASH DISTILLATION APPARATUS HAVING LOW HEAT CONSUMPTION

Pierre Jean Ricard, Paris, France, assignor to Compagnie Generale D'Etudes, Cegelerg, France

Filed Mar. 18, 1968, Ser. No. 713,897
Claims priority, application France, Mar. 17, 1967, 99,379
Int. Cl. B01d *3/06*
U.S. Cl. 202—173 **16 Claims**



Apparatus for distilling with low heat consumption a liquid having dissolved salts, by successive evaporation and expansion, including:

at least one cylindrical column formed of vertical sidewalls associated with external cooling means operating with laminar flow of a cooling liquid circulating from the bottom upwards and a plurality of transverse partitions each comprising a central portion collecting liquid to be distilled and a peripheral portion collecting the liquid condensed on the inner face of the said sidewall, the said portion which collects the liquid to be distilled being formed at its lower end with calibrated holes to permit the injection of the liquid to be distilled into the distillation cell defined by the volume of the column comprised between two consecutive transverse walls,

the injection being effected under the action of the pressure difference between two consecutive distillation cells, and the liquid to be distilled cooling as it descends from cell to cell through the distillation column.

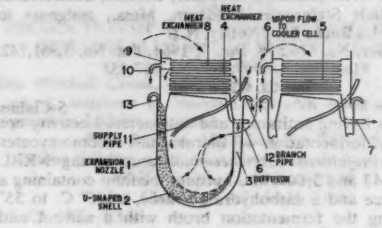
3,619,379

CENTRIFUGAL, MULTIEFFECT DISTILLATION APPARATUS

Rene Bidard, Paris, France, assignor to Compagnie Electro-Mecanique, Paris, France

Filed Feb. 25, 1969, Ser. No. 802,106
Claims priority, application France, Mar. 4, 1968, 142,244
Int. Cl. B01d *3/06*
U.S. Cl. 202—174 **6 Claims**

Device for distillation of a liquid, particularly sea water, comprises a plurality of stages each of which includes at least one cell through which the liquid flows and in which steam produced by evaporation is separated from the unevaporated liquid in order to obtain a condensate. The device employs one or more expansion nozzles in each cell through which the liquid expands and is thus converted partly into its vapor phase as a result of the reduction in pressure. The composite liquid and gaseous fluid passes along a curved flow surface



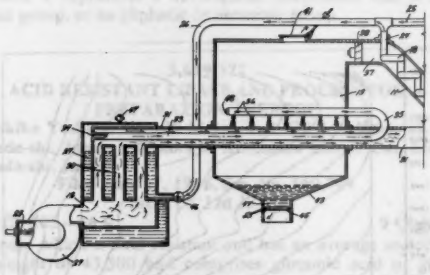
which, as a result of the centrifugal forces created effects separation of the liquid from the steam. The steam is then condensed and the remaining liquid passes through a heat exchanger and is then recycled.

3,619,380

APPARATUS FOR THE DISTILLATION OF SEA WATER

Bufford R. Stephens, 1305 Linden Ave., Boulder, Colo.

Filed Apr. 3, 1969, Ser. No. 813,099
Int. Cl. B01d *3/10*
U.S. Cl. 202—180 **7 Claims**



Impure water such as sea water is pumped through both a first preheater heated by superheated steam and a condenser heated by combustion gases from a furnace to produce wet steam which is then additionally superheated by passage through the interior of a flame tube, carrying the combustion gases from said furnace, and is then sprayed against the exterior of said flame tube within an enclosed separator to flash the contained water so as to separate and release the salts and other impurities from the steam.

3,619,381

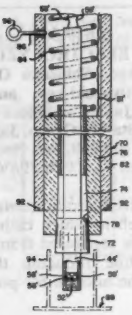
DETERMINING OXYGEN CONTENT OF MATERIALS

George R. Fitterer, 825 Twelfth St., Oakmont, Pa.

Continuation-in-part of application Ser. No. 570,855, Aug. 8, 1966, now abandoned. This application Dec. 23, 1968, Ser. No. 786,866
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **9 Claims**

A probe for use in apparatus for determining oxygen content of a material comprises an elongated envelope, a mass of solid electrolyte material supported in one end of said envelope, at least a portion of one side of said mass being exposed through a relatively small opening in said envelope for contact with said material, reference means for contacting an

apposed side of said mass with an oxygen-reference material, and circuit means for electrically contacting said apposed

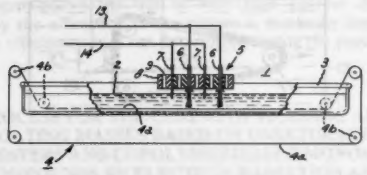


side of said mass, said envelope being fabricated electrically insulated material.

3,619,382
PROCESS OF REDUCING METAL COMPOUNDS TO METAL IN A MATRIX

John H. Lupinski, Scotia, N.Y., assignor to General Electric Company

Filed Jan. 27, 1970, Ser. No. 6,196
Int. Cl. C23b *5/64; C23f 17/00*
U.S. Cl. 204—30 **10 Claims**

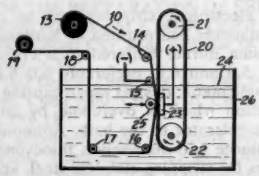


An improved process is described for electrochemically reducing specified metal oxides, and/or hydroxides, including hydrated metal oxides, in an elastomeric matrix to metal to provide an electrically conductive surface which can be metal plated. The matrix can be the entire composition or it can be a surface coating on a nonconductive substrate. The process is especially suitable for producing a multiplicity of conductive surfaces separated from each other by a nonconductive surface.

3,619,383
CONTINUOUS PROCESS OF ELECTRODEPOSITION

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Continuation-in-part of application Ser. No. 718,468, Apr. 3, 1968, now abandoned. This application May 4, 1970, Ser. No. 34,295
Int. Cl. C23j *5/50*
U.S. Cl. 204—35 R **8 Claims**

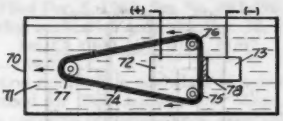


Process and apparatus for continuously electrodepositing metal of relatively uniform thickness on a moving metal substrate at extremely high plating rates.

3,619,384
ELECTRODEPOSITION

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, Mass.

Continuation-in-part of application Ser. No. 718,468, Apr. 3, 1968, now abandoned. This application May 4, 1970, Ser. No. 34,500
Int. Cl. C23b *5/50, 3/06, 5/50*
U.S. Cl. 204—35 R **17 Claims**

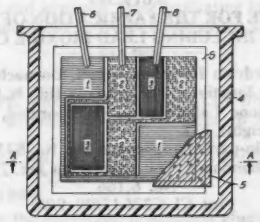


An activating medium comprising a matrix containing small, dynamically hard particles held in spaced fixed relationship to one another is continuously moved under pressure against a surface being subjected to electrodeposition of metal from aqueous or low boiling electrolytes. The dynamically hard particles repetitively contact the electrodeposit at extremely short time intervals generating new surface defect sites and increasing the areas available for nucleation, allowing the use of very high current densities and a consequent rapid rate of dense, compact metal deposition. The matrix may also serve to feed fresh electrolyte to the surface being plated thereby insuring an adequate supply of metal ions required for the rapid plating action.

3,619,385
PROCESS FOR MANUFACTURING AN ARTICLE WITH A POLYCHROME PICTURE IMPOSED ON THE SURFACE THEREOF

Nadezhda Vasilievna Rjumshina, obl., poselok Solntsevo, alitsa Sovelskaya 13, kv. 1, Moskovskaya; Gennady Fedorovich Vasiliev, K-482, Korpus 331, kv. 93, Moscow, and Georgy Markovich Vozlinsky, K-482, Korpus 447, kv. 30, Moscow, all of U.S.S.R.

Filed Feb. 5, 1968, Ser. No. 702,877
Int. Cl. C23b *9/00*
U.S. Cl. 204—35 N **3 Claims**

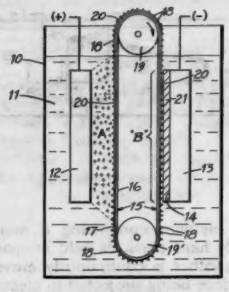


A polychrome image is produced on the surface of an article by depositing on a solid dielectric layer a thin film of a unilaterally conducting metal or alloy thereof to a thickness of at least 500 A followed by breaking the film into separate areas in conformity with the shape of the picture to be reproduced, the areas being electrically insulated from one another. Thereafter the areas are subjected to selective anodic oxidation at a constant current density of less than 10 ma./cm.^{2} and at working voltages which vary from one area to another in a range of 5 to 250 volts.

3,619,386
ELECTRODEPOSITION PROCESS USING A BIPOLAR ACTIVATING MEDIUM

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Continuation-in-part of application Ser. No. 718,468, Apr. 3, 1968, now abandoned, Continuation-in-part of application Ser. No. 863,509, Oct. 3, 1969, Continuation-in-part of application Ser. No. 863,499, Oct. 3, 1969. This application Dec. 29, 1969, Ser. No. 888,678
Int. Cl. C23j 5/50
U.S. Cl. 204—35 R 5 Claims

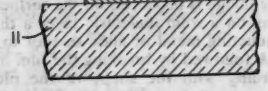


A bipolar activating medium having a metallic surface through which protrudes a plurality of small, dynamically hard, nonconductive particles held in spaced relationship to one another is insulated from any direct electrical contacts and is continuously moved under pressure against a cathodic surface being subjected to electrodeposition of metal from aqueous or low boiling electrolytes. The dynamically hard particles repetitively contact the electrodeposit at extremely short time intervals generating new surface defect sites and increasing the areas available for nucleation while the surface of the activating medium in the zone adjacent the cathodic surface acts as an anode. As the activating medium moves, that portion which acted as an anode reverts to act as a cathode while a fresh portion of the activating medium becomes anodic as it approaches the cathodic workpiece. In the zone of influence of the anode, the activating medium picks up a deposit of metal and an equal amount of metal dissolves from the portion of the activating medium which is in the zone of influence of the cathode thereby insuring an adequate supply of metal ions immediately adjacent the cathodic workpiece.

3,619,387
TECHNIQUE FOR THE FABRICATION OF THIN FILM CAPACITOR INCLUDING LEAD DIOXIDE CONDUCTIVE FILMS

Wolfgang Friedrich Hermann Mindt, Dornach, Switzerland, and George Ignatius Parisi, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Continuation-in-part of application Ser. No. 843,920, July 23, 1969, now abandoned. This application Jan. 27, 1970, Ser. No. 6,166
Int. Cl. C23f 17/00, 9/00
U.S. Cl. 204—38 A 6 Claims



Lead dioxide films are deposited upon a substrate with mechanical properties such as to permit fabrication of capacitors in which they are used as the solid electrolyte over a metal oxide dielectric. The lead dioxide is produced by the oxidation of a divalent lead compound in solution by means of a persulfate.

3,619,388
PROCESS FOR ELECTROLYZING NITRILES

Akira Yomiyama, Tokyo; Shinsaku Ogawa, Miyazaki-ken; Muneo Yoshida, Miyazaki-ken, and Takamasa Sakai, Miyazaki-ken, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Kita-ku, Osaka, Japan

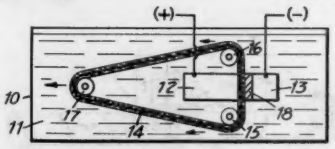
Filed Feb. 5, 1969, Ser. No. 796,912
Int. Cl. C07b 29/06
U.S. Cl. 204—73 3 Claims

A process of electrohydrodimerizing α,β-mono-olefinic nitriles in a divided cell in which catholyte containing α,β-mono-olefinic nitriles is separated from anolyte of an aqueous acid solution while reducing the concentration of hydrogen cyanide in the anolyte for preventing corrosion of the anode.

3,619,389
ELECTRODEPOSITION SYSTEM

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Continuation-in-part of application Ser. No. 718,468, Apr. 3, 1968, now abandoned. This application Oct. 3, 1969, Ser. No. 863,509
Int. Cl. B23p 1/00
U.S. Cl. 204—143 G 15 Claims



A method for maintaining anode activity in electrodeposition systems by continuously and repetitively contacting the surface of the anode during the electrodeposition reaction with a plurality of small, dynamically hard particles held in spaced, fixed relationship to one another in or on a supporting matrix.

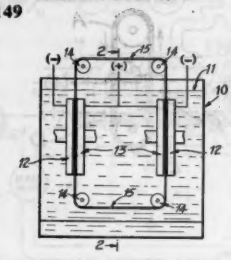
3,619,390
AQUEOUS ELECTROLYTIC STRIPPING BATH TO REMOVE METAL COATINGS FROM BASES OF STEEL

Horst Dillenberg, Kaiser-Wilhelm-allee 26, 36, Wuppertal-Elberfeld, Germany

Filed Feb. 9, 1970, Ser. No. 10,034
Claims priority, application Germany, Feb. 21, 1969, P 19 08 625.0, Dec. 18, 1969, P 19 63 415.2
Int. Cl. B01k 1/00
U.S. Cl. 204—146 14 Claims

An aqueous electrolytic stripping bath to remove metal coatings from stainless and nitrided or hardened steel comprising ammonium nitrate buffered to a critical pH range between about 5.0 and 6.8, preferably 6.0–6.8, to prevent erosion of the base metal, this pH range causing a retardation of stripping action which is overcome by adding a small amount of an accelerator to the bath. Ammonium chloride, sodium hypochlorite and ammonium thiocyanate are effective accelerators for stripping stainless steel, and water-soluble phenols are effective as accelerators for stripping nitrided or hardened steels. Erosion is slightly less at pH between 6.0 and 6.8 than at pH 5.0 to 6.0, and at pH below 5.0, erosion is substantial.

3,619,391
ELECTROCHEMICAL TREATMENT OF LIQUIDS
Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.
Filed Dec. 4, 1969, Ser. No. 882,104
Int. Cl. C02b *1/82*
U.S. Cl. 204—149 5 Claims



This invention relates to improvements in apparatus and methods for electrochemically treating industrial waste water and other polluted water such as sewage. The invention also relates to the electrochemical treating of noncontaminated liquids whereby chemically active materials are synthesized and dispersed into the liquid by electrochemical action. In addition to the conventional electrodes, there is provided a nonconductive, hard particle activating and abrading means which contacts the surface of the electrodes so as to activate the electrode surface, to remove any films adhering to the electrodes, to dislodge gas bubbles and to disperse by mechanical means any viscous liquid or solid layer of sludge which tends to form near the electrodes. The present improvement allows the use of very high current densities whereby the efficiency of the system is markedly improved, and the efficiency does not deteriorate during the process.

3,619,392
PROCESS FOR THE CURING OF MOLDING AND COATING MASSES BASED ON UNSATURATED POLYESTERS AND COPOLYMERIZABLE MONOMERIC COMPOUNDS BY ELECTRON RADIATION AND ADDITIONALLY CONTAINING PHOSPHINES, ARSINES AND STIBINES
Wolfgang Metzner, Krefeld; Hans Rudolph, Krefeld-Bockum; Wolfgang Deninger, Krefeld-Bockum, and Manfred Patheiger, Krefeld-uerdingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed July 17, 1969, Ser. No. 842,728
Claims priority, application Germany, Aug. 10, 1968, P 17 69 952.4
Int. Cl. C08d *1/00*; C08f *1/16*
U.S. Cl. 204—159.15 2 Claims

The present invention relates to molding and coating masses comprising mixtures of unsaturated polyesters and copolymerizable monomers which are curable by electron radiation. According to the invention small amounts of phosphines, arsines or stibines are added to such masses, whereby the radiation dose necessary for curing the masses may be remarkably reduced.

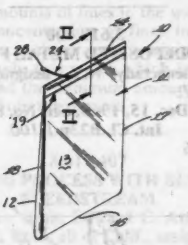
3,619,393
PROCESS FOR THE PREPARATION OF SHELF-STABLE, PHOTOCURABLE POLYTHIOLS
Eldon E. Stahly, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.
Filed Dec. 4, 1969, Ser. No. 882,340
Int. Cl. C08d *1/00*; C08f *1/16*; C08g *23/00*
U.S. Cl. 204—159.15 14 Claims

Free-radical scavenger-vinyl stabilizers are incorporated into photocurable compositions to give the composition storage stability for months. The photocurable composition contains a polythiol that adds to the vinyl group of the stabilizers upon photocuring with U.V. light, so that the stabilizer is chemically bound in the polymer molecules. The photocurable compositions can contain polyenes that also polymerize with the polythiol and can contain photocuring rate accelerators. A preferred stabilizer is triallyl phosphite. The incorporated stabilizers can be present in sufficient amounts to make the cured polymeric systems burn-resistant.

3,619,394
TRIALLYLAMINE POLYMERIZATION
Hendrik Adriaan Jacobus Battaerd, North Clayton, Victoria, Australia, assignor to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia
Filed Dec. 5, 1969, Ser. No. 882,496
Claims priority, application Australia, Dec. 20, 1968, 48200
Int. Cl. C08f *1/16*, *3/84*, *15/02*
U.S. Cl. 204—159.22 15 Claims

This invention relates to a new class of polymeric amines and to a method for their manufacture. More particularly, the invention concerns polyallylamines, especially homo and copolymers of triallylamine and their application in the so-called "Sirotherm" process.

3,619,395
METHOD OF MAKING A PILFER PROOF PACKAGE
Milorad Skendzic, New York, N.Y., assignor to Minigrip Inc., Orangeburg, N.Y.
Filed Apr. 17, 1969, Ser. No. 817,080
Int. Cl. B65d *17/20*, *33/00*
U.S. Cl. 264—171 10 Claims



A plastic fully enclosed container having a colored plastic ribbon or bead formed integrally thereon and extending adjacent one end thereof. The ribbon is removable to open the container by pulling it at one end across the width of the container. Until the ribbon is removed, however, the container is completely sealed and airtight. Removal of the ribbon not only provides a visual indication that the container has been opened but also provides a narrow slit or gap across one wall to provide access to the container. The edges of the slit or gap are jagged and irregular, thus facilitating location of the slit not only visually but by finger touch of the user.

3,619,396
ENZYMATIC PRODUCTION OF GLUCONIC ACID
Raoul Walon, Brussels, Belgium, assignor to CPC International Inc.
Filed Jan. 29, 1969, Ser. No. 795,024
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P 7 Claims

A process for the enzymatic production of gluconic acid is disclosed. In the process, an electrodialysis step is used to recover active enzyme.

3,619,397
PROCESS FOR THE PURIFICATION OF LACTIC ACID
Jean-Claude Jacquemet, Lyon, France, assignor to Rhone-Poulenc S. A., Paris, France
Filed Nov. 14, 1969, Ser. No. 877,050
Claims priority, application France, Nov. 14, 1968, 173,743
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P 7 Claims

Lactic acid obtained by fermentation of carbohydrates is purified by electrodialkysis followed by extraction with an organic solvent immiscible with water.

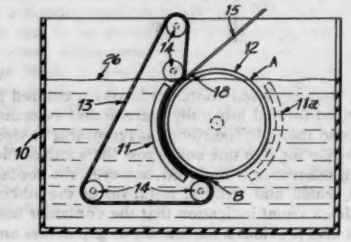
3,619,398
ELECTRODEPOSITION PROCESS
Joseph F. Bosso, Lower Burrell, Pa., and Gerald R. Gacesa, Franklin, Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 31, 1968, Ser. No. 772,353
Int. Cl. B01k 5/00
U.S. Cl. 204—181 8 Claims

A method of applying coatings by electrodeposition utilizing a water-dispersed composition in which the major resinuous component is a reaction product of a polyepoxide and a boron ester substituted with an amino group. These compositions deposit on the cathode and provide coatings of improved properties, including a high degree of corrosion resistance.

3,619,399
ACRYLIC PRIMER
Werner Josef Blank, and Gerhard Josef Pietsch, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 29, 1969, Ser. No. 872,353
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 10 Claims

A method for priming electrodeposited acrylic resin coatings to increase their adhesion to epoxy coatings which comprises treating said acrylic coatings with a polyamine and the resultant coated articles, are disclosed.

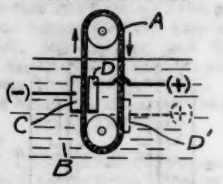
3,619,400
ELECTRODEPOSITED METAL FORMATION
Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.
Filed Dec. 15, 1969, Ser. No. 885,124
Int. Cl. B23p 1/00
U.S. Cl. 204—216 11 Claims



This invention relates to apparatus and methods for continuously producing a strip or sheet of metal by depositing metal from an electrolyte upon a moving, cathodic surface and stripping the deposited metal as a strip or sheet from said surface, wherein in addition to the cathode, anode and electrolyte supply means, there is also provided a nonconductive, hard particle activating means which contacts the surface of the initially electrodeposited metal film to activate the surface of the electrodeposited metal allowing the use of very high current densities to rapidly deposit an increased thickness of dense, compact, smooth and bright metal on the initially deposited film.

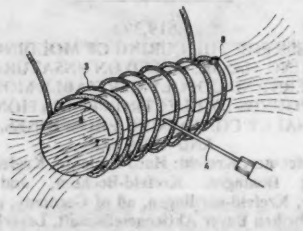
3,619,401
APPARATUS FOR ELECTRODEPOSITION
Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.
Continuation-in-part of application Ser. No. 718,468, Apr. 3, 1968, now abandoned. This application Oct. 3, 1969, Ser. No. 863,499
Int. Cl. B23p 1/00
U.S. Cl. 204—217 9 Claims

Electrodeposition apparatus where, in addition to the conventional cathode, anode and electrolyte supply means, there is also provided a nonconductive hard particle activating means and associated driving means to contact the surface of the electrodeposit under controlled pressure throughout its



formation and to both activate the surface of the electrodeposit and also to maximize the supply of fresh electrolyte directly to the activated surface.

3,619,402
PROCESS AND DEVICE FOR DEPOSITING ON SURFACES
Joseph Wurm; Pierre Beucherie, and Michel Block, all of Varese, Italy, assignors to European Atomic Energy Community, Brussels, Belgium
Filed Oct. 11, 1968, Ser. No. 766,682
Claims priority, application Belgium, Nov. 10, 1967, 50663
Int. Cl. C23c 15/00
U.S. Cl. 204—298 6 Claims

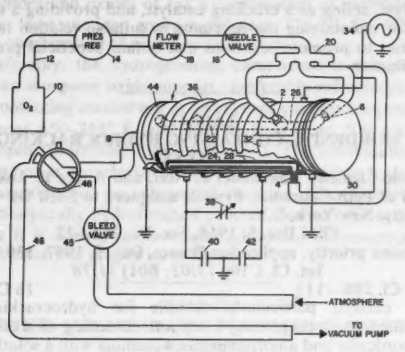


Apparatus for depositing a thin layer of a conducting or partially conducting material on the surface of a body which includes a vacuum chamber, a high-frequency coil located within the chamber for generating an electromagnetic field and means for supplying gas into the chamber in the vicinity of the electromagnetic field. A substantially tubular wall, which may be in the form of a cylinder or a truncated cone, is disposed within the high-frequency coil and electrically connected thereto. The tubular wall is slit from end to end to prevent heating by direct induction with a consequent reduction in the formation of the plasma and lowering of the efficiency of the coating operation.

3,619,403
GAS REACTION APPARATUS
Georges J. Gorin, Waltham, Mass., assignor to LFE Corporation, Waltham, Mass.
Filed June 30, 1970, Ser. No. 51,275
Int. Cl. B01k 1/00
U.S. Cl. 204—312 6 Claims

A gas, such as oxygen, is fed to a cylindrical reaction chamber to which an intense high-frequency electromagnetic radiation field is applied. As the gas enters the reaction chamber it is ionized by the high-frequency electromagnetic field. The ionized gas reacts with a nongaseous material inserted within the chamber to decompose the material. The resultant products, together with any unreacted species of

the gas, are withdrawn from the chamber by a vacuum pump. The reaction chamber is constructed so as to provide a uniform distribution of the gas throughout the reaction zone of the chamber.



3,619,404

COAL LIQUEFACTION

Robert W. Rieve, Springfield, and Harold Shalit, Drexel Hill, both of Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,118
Int. Cl. C10g *1/08*
U.S. Cl. 208—10 **6 Claims**

Normally solid coal is hydrogenated using certain supported hydrogenation catalysts in the substantial absence of externally supplied liquid slurry medium and in a catalyst/coal weight ratio of from about 0.1/1 to about 2/1.

3,619,405

GAS COMBUSTION OIL SHALE RETORTING WITH EXTERNAL INDIRECT GAS HEAT EXCHANGE

John H. Smith, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 10, 1968, Ser. No. 743,702
Int. Cl. C10g *1/00*
U.S. Cl. 208—11 **4 Claims**

A gas retorting system for recovering oil from shale including a vertical retort having a raw shale preheating zone at the top; an external circuit for cooling and separating product vapor and gas and an external circuit for heating cold recycle gas (from the top of the shale preheating zone) and reintroducing it into the bottom of the raw shale preheating zone.

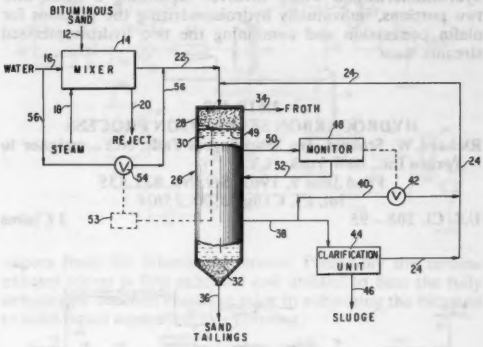
3,619,406

CONTROL OF SOLIDS IN PROCESSING BITUMINOUS SAND

Clement W. Bowman, Westfield, N.J., and Victor P. Kaminsky, Edmonton, Alberta, Canada, assignors to Canada-Cities Service, Ltd., Calgary, Alberta, Canada; Imperial Oil Limited; Atlantic Richfield Corporation and Royalite Oil Company Limited, part interest to each

Filed May 28, 1969, Ser. No. 828,681
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 **9 Claims**

The invention concerns an improvement in water separation processes for the recovery of bitumen from bituminous sand containing the same. In such processes, a fluid slurry of bituminous sand is introduced into a separation zone containing a body of water and bitumen is floated to the top of the water in the form of a froth for recovery therefrom, while sand is allowed to settle to the bottom for removal. In accordance with the invention, controlled amounts of fine solids are maintained in an intermediate layer of water in the separation zone. Between 10 and 17 weight percent fines are preferably maintained in the intermediate water layer and such fines are mostly less than 20 microns in size. The desired concentration of fines in the water layer is maintained by recycling water from the water layer back to the separation zone or to an earlier stage of the process with removal of fines from the recycle stream in response to measurements of the amounts of fines in the water layer to maintain the desired concentration of fines in the water layer. Fresh water addition to the process is minimized by removing from the process only that water which is contained in the bituminous froth and the minimum amount of water needed to withdraw solids from the process.

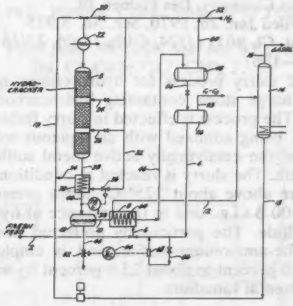


3,619,407

HYDROCRACKING PROCESS WITH BENZCORONENES BLEEDSTREAM

Grant W. Hendricks, Brea; Edward C. Attane, Orange, and James W. Wilson, Brea, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 17, 1969, Ser. No. 885,896
Int. Cl. C07c *15/00*; **C10g** *9/16, 13/02*
U.S. Cl. 208—48 R **9 Claims**



Mineral oil feedstocks which contain dissolved benzcoronenes are subjected to recycle catalytic hydrocracking over crystalline zeolite-type catalysts while bleeding from the system a small proportion of a partial condensate from the hydrocracker, the volume of the withdrawn bleedstream being controlled so as to keep the concentration of benzcoronenes in the liquid product stream from building up to a level at which they will precipitate and "plate out" in the cooler parts of the system such as heat exchange surfaces. Novel means of controlling the bleed rate are also disclosed.

3,619,408

HYDROISOMERIZATION OF MOTOR FUEL STOCKS

Lewis G. Larson, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 19, 1969, Ser. No. 859,561
Int. Cl. C07c 5/24; C10g 39/00
U.S. Cl. 208—80 5 Claims

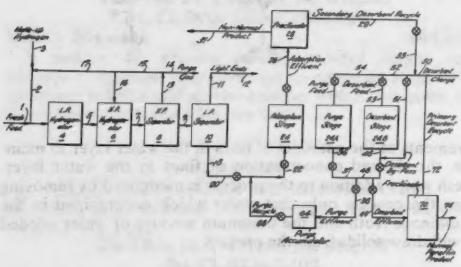
A method of obtaining an improved octane rating by hydroisomerization which involves separating a stock into two portions, individually hydroisomerizing the portions for olefin conversion and combining the two hydroisomerized streams.

3,619,409

HYDROCARBON SEPARATION PROCESS

Richard W. Stokeld, Jr., Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed June 9, 1969, Ser. No. 831,535
Int. Cl. C10g 23/00, 25/04
U.S. Cl. 208—95 3 Claims



Improved method of separating straight chain hydrocarbons from mixtures thereof with nonstraight chain hydrocarbons involving a mild hydrogenation step, a severe hydrogenation step, followed by the molecular sieve separation and recovery of the straight chain hydrocarbons.

3,619,410

SLURRY PROCESS FOR CONVERTING HYDROCARBONACEOUS BLACK OILS WITH HYDROGEN AND HYDROGEN SULFIDE

William K. T. Gleim, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 26, 1970, Ser. No. 5,915
Int. Cl. B01j 11/74; C10g 13/06, 23/16
U.S. Cl. 208—108 4 Claims

A catalytic slurry process for hydrorefining a hydrocarbonaceous charge stock containing hydrocarbon insoluble asphaltenes. The process is effected in slurry fashion with the charge stock being admixed with an aqueous solution of a double salt of the catalytically active metal sulfite and ammonium sulfite. The slurry is reacted at conditions including a temperature above about 225° C. and a pressure greater than about 500 p.s.i.g., and in the presence of hydrogen and hydrogen sulfide. The particularly preferred double salt is vanadyl sulfite-ammonium sulfite, and is employed in an amount of 1.0 percent to about 25.0 percent by weight, computed as elemental vanadium.

3,619,411

PROCESS OF CONVERTING HIGH-BOILING HYDROCARBON TO LOWER-BOILING FLUID PRODUCTS

Milton M. Wald, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,842
Int. Cl. B01j 11/78; C10g 13/08, 23/16
U.S. Cl. 208—108 10 Claims

Very high-boiling hydrocarbon, such as petroleum residue, is converted to low-boiling liquid products by passing it through a continuous phase of a catalyst system selected from antimony trichloride, tribromide or triiodide; bismuth trichloride or tribromide; or arsenic triiodide; maintained at a temperature between 200° and 550° C. and under hydrogen partial pressure of at least 250 p.s.i. whereby the catalyst system performs the functions of acting as a hydrogenation catalyst, acting as a cracking catalyst, and providing a medium for maintaining the reactants in suitable relation to one another to promote reactions and obtain beneficial product distribution.

3,619,412

MORDENITE-CONTAINING HYDROCRACKING CATALYST

Claude Clement; Emmanuel E. Neel, and Andre P. Anselme, all of Petit-Couronne, France, assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 5, 1968, Ser. No. 781,622
Claims priority, application France, Dec. 5, 1967, 130,974
Int. Cl. C10g 13/02; B01j 11/78
U.S. Cl. 208—111 16 Claims

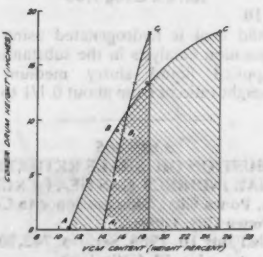
A catalyst particularly suitable for hydrocracking is prepared by impregnating a support consisting of a mixture of mordenite and amorphous silica-alumina with a solution of a fluorine compound, drying, and treating with a solution containing one or more hydrogenative metals.

3,619,413

PROCESS FOR MAKING DELAYED PETROLEUM COKE

Hillis O. Folkins, Claremont, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 16, 1970, Ser. No. 29,070
Int. Cl. C10g 9/14
U.S. Cl. 208—131 10 Claims



A method of making quality coke having improved uniformity is obtained by coking a high boiling hydrocarbon in the presence of a halogen, a hydrogen halide or a hydrocarbyl halide under delayed coking conditions comprising a temperature from 800° to 1200° F. and a pressure from 1 to 10 atmospheres and sufficient to convert the coking feedstock to vapors and dry coke.

3,619,414

CATALYTIC HYDROFINISHING OF PETROLEUM DISTILLATES IN THE LUBRICATING OIL BOILING RANGE

Ivor W. Mills, Media; Merritt C. Kirk, Jr., Thronton, and Albert T. Olenzak, Media, all of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 622,398, Mar. 13, 1967, now Patent No. 3,462,358, Continuation-in-part of application Ser. No. 636,493, May 5, 1967, Continuation-in-part of application Ser. No. 652,026, July 10, 1967, Continuation-in-part of application Ser. No. 730,999, May 22, 1968. This application Feb. 19, 1969, Ser. No. 812,516
Int. Cl. C10g 23/02
U.S. Cl. 208—143 17 Claims

A process for the catalytic hydrofinishing of petroleum distillate in the lubricating oil boiling range (e.g., to produce lube oils, rubber oils, refrigerator oils, transformer oils, cable oils ATF and friction drive transmission fluids, etc.) com-

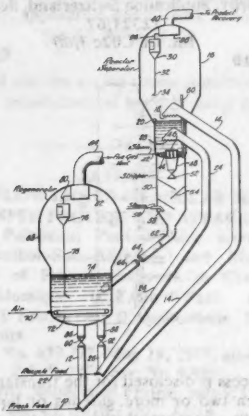
prises contacting a lubricating oil distillate stock with hydrogen, in the presence of a catalyst comprising a hydrogenating component selected from the group consisting of sulfides and oxides of (a) a combination of molybdenum and at least one iron group metal (e.g., Co, Ni, Fe, W) and (b) a combination of nickel and tungsten.

Preferably, the hydrogenating component is composited with an inorganic oxide support (preferably refractory), and the contacting carried out at an average catalyst temperature of about 650–765° F. and with at least from 500 p.s.i. of hydrogen (preferably 800–3000 p.s.i.). The combination of conditions is so selected as to effect appreciable hydrogen consumption but no substantial cracking. Clay finishing of the catalytically hydrofinished product can be advantageous where it is desired to have such additional improvement as better electrical properties or lighter color.

3,619,415
METHOD AND APPARATUS FOR FLUID CATALYTIC CRACKING

Henry B. Jones; Dorrance P. Bunn, Jr., and Dale Williams, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 29, 1969, Ser. No. 845,824
Int. Cl. C10g *13/18*
U.S. Cl. 208—164 **20 Claims**



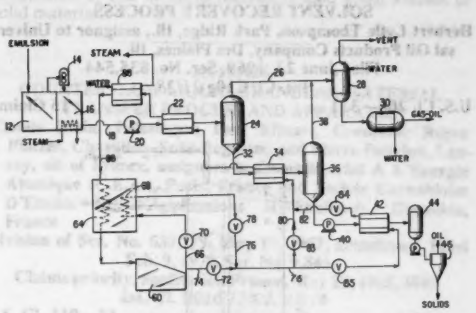
This invention relates to an improved method and apparatus for fluid catalytic cracking of hydrocarbon oils, for example, virgin gas oils from petroleum sources and cycle gas oils from the cracking thereof. More particularly, this invention relates to fluid catalytic cracking of at least one feedstock in transfer line risers terminating in a multidiameter reactor-separator chamber with attendant stripping and regenerator of the catalyst.

3,619,416
DEHYDRATION OF BITUMINOUS EMULSION

Robert D. Hendry, Edmonton, Alberta, Canada, assignor to Canada-Cities Service, Ltd., Calgary, Alberta, Canada; Imperial Oil Limited; Atlantic Richfield Corporation and Royalite Oil Company Limited, part interest to each

Filed Oct. 1, 1968, Ser. No. 764,188
Int. Cl. C10g *33/00*
U.S. Cl. 208—187 **3 Claims**

A process for the thermal dehydration of a bituminous emulsion with heat from exhaust steam while simultaneously condensing the exhaust steam is disclosed herein. The process comprises heating a stream of bituminous emulsion by heat transfer from partially cooled steam turbine exhaust steam, to vaporize low boiling materials, principally water, and condense the steam, separating the vapor from the bituminous emulsion to partially dehydrate the emulsion, heating the partially dehydrated emulsion to a higher temperature by heat transfer from the exhaust steam of the steam turbine to vaporize the remaining water, and separating the water



vapors from the bituminous stream. Preferably the turbine exhaust steam is first reheated and utilized to heat the fully dehydrated bitumen emulsion prior to subjecting the bitumen to solid-liquid separation by cycloning.

3,619,417
SPLIT FEED HYDRODENITRIFICATION

Marc J. Sims, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 29, 1969, Ser. No. 854,275
Int. Cl. C10g *23/00*
U.S. Cl. 208—254 H **5 Claims**

In a split feed hydrodenitrification process, the improvement is made which comprises:

a. maintaining the L.H.S.V. in the heavy oil conversion zone at less than 75 percent of the L.H.S.V. in the light oil conversion zone;

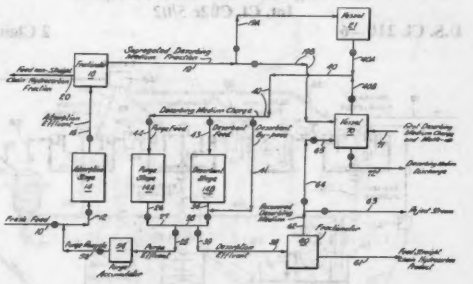
b. maintaining the inlet temperature to the heavy oil conversion zone at least 25° F. below the inlet temperature in the light oil conversion zone; and

c. reducing the organic nitrogen content to an average of less than 50 p.p.m. on a nitrogen weight basis for the light oil and heavy oil hydrodenitrified fractions.

3,619,418
STORING DESORBENT SEPARATED FROM ADSORPTION EFFLUENT

Ralph M. Lewis, Weston, Conn., assignor to Texaco Inc., New York, N.Y.

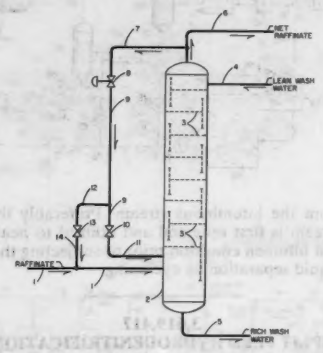
Filed June 30, 1969, Ser. No. 837,798
Int. Cl. C07c *7/12*; C10g *25/04*
U.S. Cl. 208—310 **6 Claims**



Improved process for the separation of straight chain hydrocarbons from petroleum fractions containing same admixed with nonstraight chain hydrocarbons by a molecular sieve selective adsorbent of Type 5A structure wherein a first desorbing medium of relatively low purity with respect to its straight chain hydrocarbon content is used as the first desorbing medium of the process to produce a final desorbing medium having a relatively high purity in straight chain

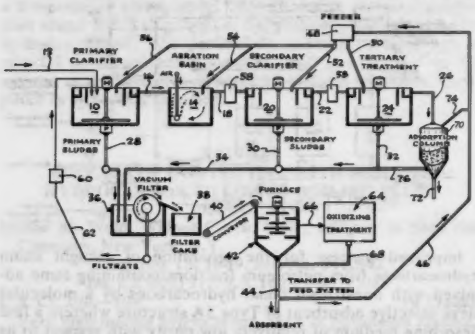
hydrocarbon content while producing straight chain hydrocarbon products.

3,619,419
SOLVENT RECOVERY PROCESS
Herbert Lytle Thompson, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed June 23, 1969, Ser. No. 835,544
Int. Cl. C10g 21/28
U.S. Cl. 208—321 15 Claims



An improved process for the extraction of water soluble primary solvent contained in a raffinate hydrocarbon stream produced by a primary extraction process, wherein the primary solvent is contacted with an aqueous secondary solvent under extraction conditions in an extraction zone comprising an extraction tower containing a plurality of perforated extraction decks. The improvement comprises passing the solvent-containing raffinate through the perforations of the extraction decks at a hole velocity greater than 2 feet per second, and preferably in the range of from about 5 to about 8 feet per second. The process has particular application where the raffinate stream comprises nonaromatic hydrocarbons, the primary extraction process comprises an aromatic process, the secondary solvent comprises water, and the primary solvent comprises a sulfolane-type chemical solvent or a polyalkylene glycol solvent. One preferred application is in the recovery of sulfolane from nonaromatic raffinates in the water wash tower of an aromatic extraction processing plant.

3,619,420
SEWAGE TREATMENT PROCESS
Frank N. Kemmer, La Grange; Reed S. Robertson, Glen Ellyn, and Rodney D. Mattix, Lemont, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.
Filed Aug. 22, 1969, Ser. No. 852,421
Int. Cl. C02c 5/02
U.S. Cl. 210—6 2 Claims



A continuous sewage treatment process for upgrading the quality of sewage plant effluent by converting sewage sludges to active substances and returning these active substances to the sewage system whereby removal of dissolved contaminants occurs by the addition of the active substances.

3,619,421
SEWAGE TREATMENT PROCESS AND APPARATUS
Millice Floyd Hobbs, Monte Sereno; Rayburn W. Prettyman, San Jose; John H. Blake, Portola Valley, and Robert A. Fisher, Los Gatos, all of Calif., assignors to FMC Corporation
Filed Jan. 31, 1969, Ser. No. 795,704
Int. Cl. C02c 1/12
U.S. Cl. 210—7 11 Claims

The process of this invention deals with the operation of tanks in which sewage is aerated to accomplish homogeneous mixing and fast B.O.D. removal. In the illustrative embodiment, air injection is proportioned so that air dispersers positioned adjacent the effluent side of the aeration tank receive at least 51% of the total air input.

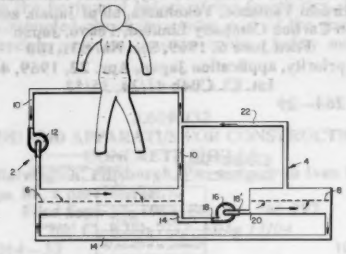
3,619,422
PROCESS OF DRYING SEWAGE SLUDGE
Roman Rummel, deceased, late of Bruhl; by Elsa Rummel, Heir, Bruhl; Irmgard Rummel, Heir, Backnang; Heinz Rummel, Heir, Bruhl, and Inge Rummel, Heir, Bruhl, all of Germany, assignors to Von Roll AG, Gerlafingen, Switzerland
Filed Aug. 30, 1968, Ser. No. 758,185
Claims priority, application Switzerland, Sept. 4, 1967, 12321/67
Int. Cl. C02c 3/00
U.S. Cl. 210—10 4 Claims

A novel process is disclosed for the transfer of heat and/or matter between two or more gaseous or liquid agents, the process utilizing a carrier substance continuously circulated in closed cycle successively through at least two working spaces wherein heat and/or mater is respectively taken up and yielded. The carrier substance is present in a thin layer and the agents are caused to flow across the layer of carrier substance at both working spaces. Novel mechanical assemblies for the performance of said process are also disclosed herein.

3,619,423
CASCADE DIALYSIS APPARATUS AND METHOD
Pierre M. Galletti, Providence, R.I.; Larry Martel, Boston, Mass., and Michael T. Snider, Providence, R.I., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare
Filed Apr. 20, 1970, Ser. No. 30,112
Int. Cl. B01d 3/00, 13/00
U.S. Cl. 210—22 10 Claims

A system, such as an artificial kidney, is disclosed which facilitates the removal of undesirable substances found in a fluid material, such as blood. The system utilizes a dialyzer and an ultrafilter having selectively permeable membranes and having an endless fluid material recirculating flow path and pump. The dialyzer and ultrafilter are joined together by a dialysate endless loop recirculating flow path containing a chemical agent, such as an enzyme, which is utilized for the reduction of undesirable substances present in the blood. No

chemical agents are introduced into the blood stream, nor



are any of the desirable components of the blood removed in the practice of the invention.

3,619,424

SEMIPERMEABLE MEMBRANES

Alain Blanchard; Andre Rio, and Gilbert Vivant, all of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Oct. 6, 1969, Ser. No. 864,186
Claims priority, application France, Oct. 7, 1968, 168,986
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 8 Claims

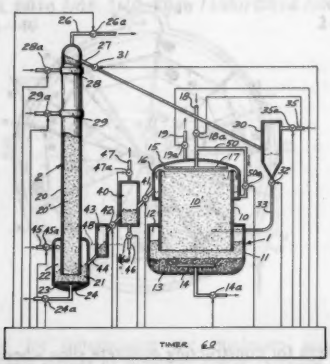
Polyamides of diamines with amino-isophthalic acid make semipermeable membranes of good stability and salt rejection.

3,619,425

COUNTERFLOW LIQUID-GRANULAR MATERIAL TRANSFER PROCESS AND APPARATUS

Claude Blain, Palaiseau; Paul Minart, Grenoble; Roger Platzer, Chattillon-Sous-Bagneux, and Marc Pelletier, Grenoble, all of France, assignors to Commissariat A L'Energie Atomique (C.E.A.), Paris and Societe Grenobloise D'Etudes et D'Applications Hydrauliques, Grenoble, France

Division of Ser. No. 639,777, May 19, 1967, abandoned. Filed Feb. 9, 1970, Ser. No. 9,831
Claims priority, application France, July 9, 1966, 4970
Int. Cl. B01d *15/02, 33/16*
U.S. Cl. 210—33 15 Claims



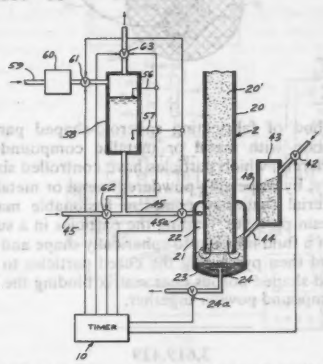
In the closed cycle, mobile bed, liquid-solid treatment installation disclosed herein, a given volume of the solid material is periodically displaced in the treatment chamber by a given volume of liquid under a given pressure. The solid material is advanced in the cycle through two columns which are separated from each other by at least one intermediate receiver that is located between two isolation valves through which the solid material passes without being crushed, and that receives from one of the columns a constant volume constituted of one or more batches of said given volume of solid material.

3,619,426

COUNTERFLOW LIQUID-GRANULAR MATERIAL TRANSFER PROCESS AND APPARATUS

Claude Blain, Palsaiseau; Paul Minart, Grenoble; Roger Platzer, Chattillon-Sous-Bagneux, and Pierre Pouchot, Lancey, all of France, assignors to Commissariat A L'Energie Atomique (C.E.A.), Paris, France and Societe Grenobloise D'Etudes Et D'Applications Hydrauliques, Grenoble, France

Division of Ser. No. 639,777, May 19, 1967, abandoned. Filed Feb. 9, 1970, Ser. No. 9,846
Claims priority, application France, May 20, 1966, 4940
Int. Cl. B01d *15/02, 33/16*
U.S. Cl. 210—33 6 Claims



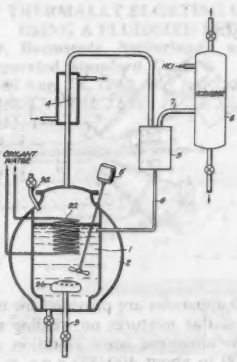
In the closed cycle, mobile bed, liquid-solid treatment installation disclosed herein, a given volume of the solid material is periodically displaced in the treatment chamber by a given volume of liquid under a given pressure.

3,619,427

METHODS OF SCALE INHIBITION USING POLYALKYLENE POLYAMINO POLYKIS METHYLENE PHOSPHONIC ACIDS AND THEIR SALTS

George J. Kautsky, Los Angeles, Calif., assignor to Textilana Corporation, Hawthorne, Calif.

Filed June 22, 1970, Ser. No. 48,164
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 24 Claims



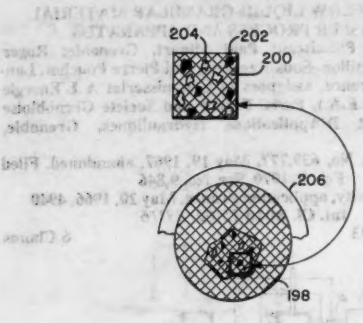
This invention relates to methods of scale inhibition using polyalkylene polyamino polykis methylene phosphonic acids and their salts.

3,619,428

POROUS PARTICLE FABRICATION PROCESS

Constant V. David, 2625 Loring St., San Diego, Calif.

Filed Apr. 5, 1968, Ser. No. 719,069
Int. Cl. G21c *21/00*
U.S. Cl. 264—.5 13 Claims



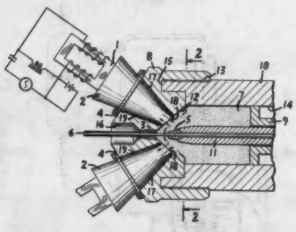
The method of fabricating spheroid-shaped particles of porous carbon with metal or metallic compound powder dispersed therein, which particles have controlled size, shape and porosity, by dispersing powdered metal or metallic compound material that may comprise fissionable material in precured resin particles, heating the particles in a suspended condition in a fluid medium to spherically shape and cure the particles and then pyrolyzing the cured particles to produce the spheroid-shaped porous char matrix binding the metal or metallic compound powder together.

3,619,429

METHOD FOR THE UNIFORM EXTRUSION COATING OF WELDING FLUX COMPOSITIONS

Yasuo Torigai, Funabashi-shi, and Keizo Ishizaki, Tokyo, both of Japan, assignors to Yawata Welding Electrode Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 656,969, May 22, 1967, now Patent No. 3,456,295, dated July 22, 1969, Division of Ser. No. 656,969, May 22, 1967, Pat. No. 3,456,295, which is a division of application Ser. No. 552,655, Mar. 29, 1966, now abandoned, which is a continuation of application Ser. No. 337,644, Jan. 15, 1964, now abandoned. Filed June 4, 1969, Ser. No. 830,332
Int. Cl. B06b *3/00*; B29f *3/10*
U.S. Cl. 264—23 8 Claims



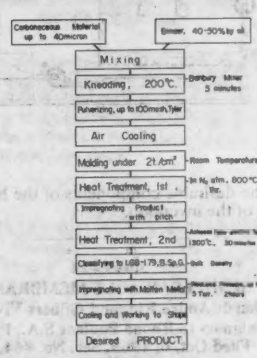
A method and apparatus are provided for the uniform extrusion coating of flux mixtures on welding rod or wire, in which a sonic or ultrasonic wave vibration at a frequency from about 5,000 to about 400,000 c.p.s. is applied to the flux mixture to maintain its uniformity, and thereby prevent the obstruction to the smooth extrusion coating of the welding flux mixture as the flux mixture is fed under pressure to the extrusion nozzle.

3,619,430

METHOD OF MAKING A METAL IMPREGNATED CARBON PRODUCT

Toshio Hiratsuka, Yokohama; Toyonosuke Kanemaru, Zushi, and Hiroshi Yamazoe, Yokohama, all of Japan, assignors to Nippon Carbon Company Limited, Tokyo, Japan

Filed June 6, 1969, Ser. No. 831,160
Claims priority, application Japan, Apr. 22, 1969, 44/30706
Int. Cl. C04b *41/24*, *35/52*
U.S. Cl. 264—29 4 Claims



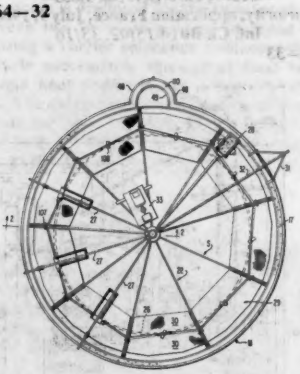
A seal material having an improved wear resistance under a severe rotary and vibration condition at elevated temperatures can be produced by the steps of providing a mass of coke powder with a particle size less than 40 micron, mixing the coke powder and a binder by a mixer of Banbury type, molding the mixture to shape, selecting a product having a bulk density of in the range of 1.68–1.79, impregnating the product with a molten metal, and cooling it to room temperature.

3,619,431

METHOD AND APPARATUS FOR CONSTRUCTING A MONOLITHIC SILO

Richard L. Weaver, and Benjamin K. Smoker, both of Myerstown, Pa., assignor to Weaver by said Smoker

Filed Apr. 11, 1968, Ser. No. 720,687
Int. Cl. E04b *1/16*; E04h *7/22*
U.S. Cl. 264—32 16 Claims



System for constructing concrete silos wherein molds are sequentially erected and filled as a three tiered mold unit with a crane scaffold supported on the top mold by radial arms which rest on ledges extending inwardly from the inner-face thereof. The outer form of the bottom mold is then dismantled into semicircular sections, raised by using the three jib cranes of the crane scaffold and erected as the fourth tier. The inner form of the bottom mold is then dismantled in predetermined length sections for passage

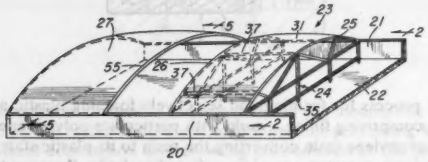
through the restricted space between the crane scaffold and the third tier and then erected to complete the fourth tier mold. The crane scaffold is then elevated by suspending it from the top of the fourth tier; the radial arms are then seated on the horizontal ledges of the fourth tier. A cart is rotatably mounted about the center post of the scaffold for evenly feeding concrete into the molds. Safety means are provided.

3,619,432

METHOD AND APPARATUS FOR CONSTRUCTION OF CONCRETE SHELLS

Horrall Harrington, Pittsburgh, Pa., assignor to Ivan Himmel, Chicago, Ill., a part interest

Filed Sept. 17, 1968, Ser. No. 760,297
Int. Cl. B28b *7/32*; **E04g** *11/04*
U.S. Cl. 264—32 **10 Claims**



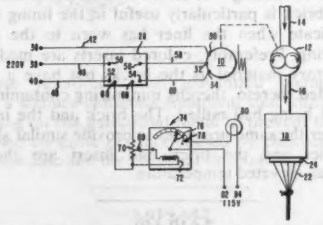
A method of constructing a concrete shell, employing a form assembly comprising a rigid structural frame with an inflatable fabric form mounted on the frame, the frame having a configuration generally conforming to one segment of the concrete shell. The form assembly is aligned with a portion of a building foundation structure and is inflated; metal reinforcements are then positioned on the external surface of the form. Concrete is deposited over the form and allowed to set, after which the form is deflated and the form assembly moved to a new position adjacent the completed shell segment for construction of the next segment of the shell. Small precast concrete chair members, used to support the metal reinforcement of the fabric form, become a part of the completed shell.

3,619,433

METHOD FOR DETERMINING FILAMENT DENIER OF FILAMENTS SPUN FROM A SPINNING PACK

William Thomas Windley, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 641,598, May 26, 1967, now abandoned. This application Oct. 13, 1969, Ser. No. 871,745
Int. Cl. D01d *1/08, 5/10*; **F04b** *13/00*; **G01d** *1/06*
U.S. Cl. 264—40 **2 Claims**



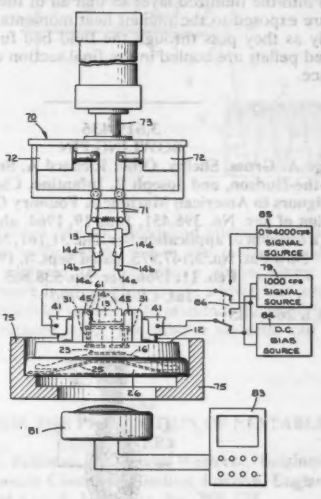
A method for determining the minimum acceptable average filament denier of filaments being extruded from a spinning pack supplied with polymer at a constant metered rate by a meter pump driven by a constant speed electric motor. The power input to the motor which has been correlated to average filament denier is continuously detected by a wattmeter that supplies a signal to a device for signalling the occurrence of power input corresponding to minimum acceptable average filament denier.

3,619,434

METHOD OF ADJUSTING THE AIRGAP OF AND FINALLY ASSEMBLING ELECTRICAL TRANSDUCERS OF THE CENTRAL ARMATURE RECEIVER TYPE

Joseph E. Blastic, Indianapolis; Norbert B. Karau, Indianapolis, and Archie F. Kerr, Noblesville, all of Ind., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 737,164, June 14, 1968, Pat. No. 3,542,974. Filed Dec. 15, 1969, Ser. No. 889,797
Int. Cl. B32b *31/06*; **H04r** *29/00*; **H04r** *31/00*
U.S. Cl. 264—40 **11 Claims**



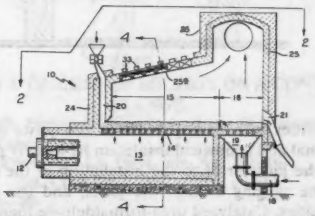
The airgap adjustment and final assembly of electrical transducers of the central armature type, such as those employed as receivers in telephone sets, is accomplished by adapting the receiver frame to engage frictionally and temporarily support the magnet pole piece assembly during the adjustment of the airgap. Both an AC signal and a selectively variable DC bias, simultaneously applied to the coils of the receiver, are employed in determining the proper airgap spacing which results in the receiver producing an optimum value of acoustic output falling within predetermined minimum limits. After adjusting the airgap, a solidifiable liquid cement or a suitable potting compound is employed to secure the magnet pole piece assembly permanently and rigidly to the frame of the receiver.

3,619,435

METHOD OF THERMALLY BLOATING CLAY PELLETS USING A FLUIDIZED BED

Henry Kepper, Heemstede, Netherlands, assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Aug. 19, 1968, Ser. No. 753,369
Int. Cl. C04b *21/00, 21/02, 33/32*
U.S. Cl. 264—43 **3 Claims**



Method for producing expanded lightweight aggregate by heat-treating prepared predried clay pellets or the like in a

fluidized bed maintained by hot gases, assisted by additional radiating heat directed downwardly upon the bed, with means for separately controlling the amount of radiating heat, and the bed temperature, whereby the bed temperature is maintained substantially below the surface sintering temperature of the pellets, but above the temperature required to expand the pellets.

The upflow rate or velocity of gases in the fluid bed are controlled in such a manner that the pellets are constantly raised to the surface where the downwardly directed radiant heat forms a sintered or glassy outer skin on the expanded pellets. The turbulence caused by the controlled velocity of the gasses then causes these pellets to be circulated back down into the fluidized layer so that all of the expanded pellets are exposed to the radiant heat momentarily and repetitiously as they pass through the fluid bed furnace. The expanded pellets are cooled in the final section of the fluid bed furnace.

3,619,436

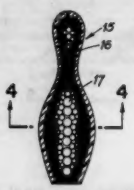
BOWLING PIN

George A. Gruss, Shelby, Ohio; Richard A. Smith, Cornwall-on-the-Hudson, and Joseph R. Infantino, Chappaqua, N.Y., assignors to American Machine & Foundry Company

Division of Ser. No. 396,451, June 19, 1964, abandoned, which is a division of application Ser. No. 31,161, May 23, 1960, Now Pat. No. 3,147,975, dated Sept. 8, 1964. Filed Feb. 11, 1966, Ser. No. 538,865

Int. Cl. B29d *9/00*

U.S. Cl. 264—45 **1 Claim**



Briefly, this invention deals with the manufacture of a bowling pin wherein a shell of solid synthetic resin which has the general contour of the finished pin is inserted into a mold and thereafter a commensurate quantity of expandable synthetic resin together with an expanding agent is introducted into the shell and is expanded to entirely fill the shell and form a bowling pin.

3,619,437

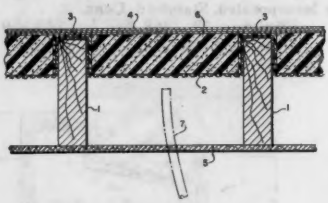
METHOD OF CHARGING A CAVITY WITH UREA-FORMALDEHYDE FOAM INSULATING MATERIAL

James R. McDonald, Jr., Sacramento, Calif., assignor to U.F. Chemical Corporation, Woodside, N.Y.

Filed Feb. 25, 1969, Ser. No. 802,022

Int. Cl. B29d *27/04*

U.S. Cl. 264—45 **7 Claims**



The cavities in a ceiling between the joists are charged with thermal and acoustical insulation by loosely placing burlap over the joists prior to the installation of the subflooring so that the sagging burlap, the joists, and the subflooring define cavities. Catalyzed urea-formaldehyde foam is sprayed from below against the burlap and penetrates into the cavities where it is solidified into a porous mass having excellent insulating properties.

3,619,438

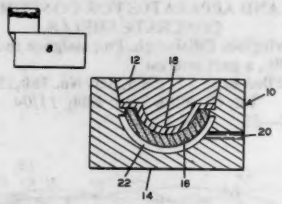
PROCESS FOR FOAMING OF A MOLDED ARTICLE IN A POROUS MOLD

David R. Cistone, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of application Ser. No. 614,602, Feb. 8, 1967, now abandoned. This application Aug. 19, 1969, Ser. No. 863,738

Int. Cl. B29d *27/00*

U.S. Cl. 264—45 **1 Claim**



A process for forming and selectively foaming plastic articles comprising filling a mold with particulate polystyrene or polypropylene resin converting the resin to its plastic state by heat and pressure, passing a liquid volatile fluorocarbon foaming agent through a porous section of the mold cavity to permit permeation of the resin by the foaming agent, and then releasing the molding pressure to permit foaming. Only the portion of the article corresponding to the location of the porous mold areas is foamed.

3,619,439

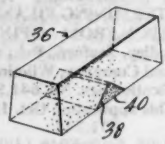
METHOD OF MAKING A BRICK WITH WEAR INDICATOR

Robert F. Rea, Bloomfield Township, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Division of Ser. No. 533,033, Mar. 9, 1966. Filed Feb. 7, 1969, Ser. No. 797,414

Int. Cl. C04b *33/32, 35/64*

U.S. Cl. 264—56 **7 Claims**



A method of making a brick with a color indicator is provided. The brick is particularly useful in the lining of a ball mill to indicate when the liner has worn to the point of possibly failing. Preferably, colored inserts are made of the same refractory material as the bricks but have a coloring material added thereto, thereby minimizing contamination of the material being ball milled. The brick and the insert are formed under the same pressures to provide similar shrinkage characteristics and the brick and insert are then fired together at an elevated temperature.

3,619,440

PREVENTION OF CRAWLING OF METAL OXIDE HOLLOW ARTICLES ALONG THE SUPPORT MANDREL DURING SINTERING

Foster Lee Gray, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

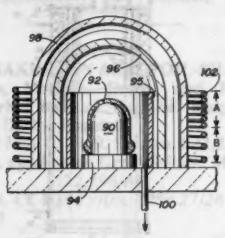
Filed Dec. 18, 1969, Ser. No. 886,253

Int. Cl. C04b *33/32, 35/64*

U.S. Cl. 264—60 **17 Claims**

The method of sintering amorphous of amorphous metal oxide, and in a preferred embodiment crucibles and tubing of

fused silicon dioxide, by depositing a porous layer of amorphous metal oxide on a deposition surface, and thereafter partially sintering the edges of the metal oxide article to less than 90 percent of its theoretical density and substantially sintering the remainder of the metal oxide article to greater than 90 percent of its theoretical density. By only partially sintering the edge portions sufficient frictional forces are produced with the mandrel to exceed the surface



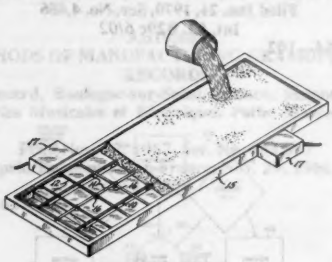
tension forces created in the remainder of the metal oxide article by the higher sintering temperature thus preventing longitudinal contraction and crawling encountered in the prior art processes. For a silicon dioxide article, the edges of the mandrel are sintered at a temperature in the range of 1,250° C. to 1,350° C.; the remainder of the article is sintered at a temperature in the range of 1,450° C. to 1,550° C. The partially sintered portion is then severed from the fully sintered portion to produce the desired article.

3,619,441

METAL TREATMENT TO PREVENT CORROSION AND BLEMISHES IN METAL REINFORCED CONCRETE STRUCTURES

Knox Ryan Burchett, Virginia Beach, Va., assignor to Southern Block and Pipe Corporation, Norfolk, Va.

Filed Apr. 3, 1969, Ser. No. 813,197
Int. Cl. C23f 7/26
U.S. Cl. 264—71 **3 Claims**



Concrete reinforced with galvanized metal that has received a sodium chromate treatment that forms a protective coating on the galvanized metal to prevent blemishes in the finished concrete product caused by chemical reactions between the zinc and the alkalis of the concrete.

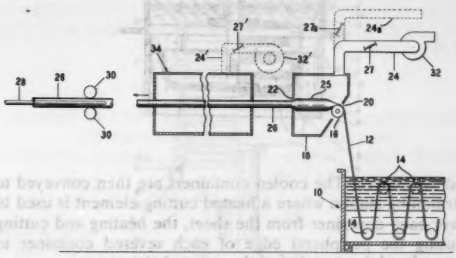
3,619,442

METHOD FOR INFLATING COLLAPSED TUBING

William E. Henderson, Hinsdale, Ill., assignor to Union Carbide Corporation

Filed Apr. 18, 1968, Ser. No. 722,384
Int. Cl. B29c 17/02
U.S. Cl. 264—89 **8 Claims**

A method for inflating collapsed tubular material without rupturing the material or adversely affecting the elongation and stretch characteristics thereof. In a first embodiment, the collapsed material is fed into a chamber while air is introduced into the interior of the material at a pressure sufficient to maintain the material open by relaxed when inflated. The pressure in the chamber is adjusted to create an increased net internal pressure in the material which causes the material to be inflated. The material is maintained in the chamber under the increased pressure only for that time necessary to inflate the material as the increased pressure would adversely affect the material if maintained therein. In



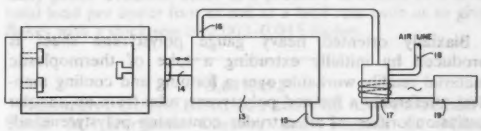
a second embodiment, the air introduced internally of the tubular material is sufficient to inflate the material and the material, once inflated, is fed into a drying-sizing unit wherein the pressure is adjusted to create a lower net internal pressure in the material sufficient to maintain the material inflated but in a relaxed state. The tubular material can be a collagen.

3,619,443

METHOD FOR THE PRODUCTION OF NESTABLE CONTAINERS

Peter Blandford Feldman, St. Denijs-Westrem, Belgium, assignor to Monsanto Chemicals Limited, London, England

Filed Aug. 5, 1968, Ser. No. 750,225
Claims priority, application Great Britain, Aug. 15, 1967, 37519/67
Int. Cl. B29c 17/04, 24/00; B65d 21/02
U.S. Cl. 264—89 **2 Claims**



A method for altering the configuration of a series of containers produced in a mold such that the containers can be nested together without sticking. A first container is made by differential pressure forming a thermoplastic sheet in a mold having means for forming stacking lugs in the surface of the container. The means forming the stacking lugs are then automatically altered in position so as to present a mold having a different configuration at the surface where the stacking lugs are formed and a second container is formed in the mold. The containers are then nested and the stacking lugs of different configuration prevent sticking together of the containers.

3,619,444

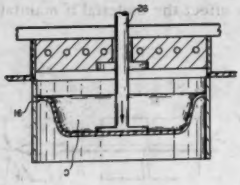
FORMING A THICKENED SECTION ON A CONTAINER FLANGE

John K. Roth, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1968, Ser. No. 786,262
Int. Cl. B29c 17/04, 17/14, 23/00
U.S. Cl. 264—89 **1 Claim**

A method for forming a thickened outer section on a flange of a biaxially oriented thermoplastic container. A generally continuous polystyrene sheet is stretched in two directions and successive portions of the sheet are forced

against a heating platen so as to heat the portions while preventing any relaxation of the stresses induced by the stretching. Plural numbers of the flanged containers are then formed from each successive sheet portion by fluid pressure



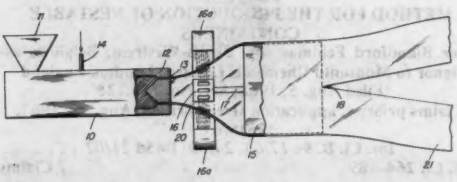
and are cooled. The cooled containers are then conveyed to a trimming station where a heated cutting element is used to sever each container from the sheet, the heating and cutting causing the peripheral edge of each severed container to form a bead due to relief of the induced stresses.

3,619,445

METHOD FOR PRODUCING BIAXIALLY ORIENTED POLYSTYRENE HEAVY GAUGE SHEET

Frank A. Carlson, Jr., Pittsford, N.Y., assignor to Mobil Oil Corporation

Filed Aug. 2, 1968, Ser. No. 749,738
Int. Cl. B29d *7/02*
U.S. Cl. 264—95 **1 Claim**



Biaxially oriented heavy gauge polystyrene sheet is produced by initially extruding a tube of thermoplastic material readily workable over a forming and cooling mandrel, preferably a foamed polystyrene tube from an annular extrusion orifice of an extruder containing polystyrene admixed with a nucleating agent and a foaming agent, passing the tube (or other workable thermoplastic) over a forming and cooling mandrel having a diameter larger than the orifice, slitting the tube and taking up sheets on takeup rolls, wherein the tube between the orifice and the mandrel is supported by injecting a gaseous medium (e.g., air) insided the tube. Thereafter, in the case of polystyrene foam initiation, the addition of nucleating agent and foaming agent is discontinued, extrusion temperature is adjusted, and the rate of injection of gas inside the tube is adjusted to an amount that a gas cushion forms between the polystyrene tube and the mandrel, and the operation is continued to produce clear oriented polystyrene sheet.

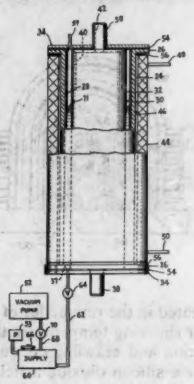
3,619,446

METHOD FOR MAKING RESILIENTLY FACED ROLLS

Jan P. Nauta, West Hartford, Conn., assignor to Rowland Products Incorporated, Kensington, Conn.

Filed Feb. 2, 1968, Ser. No. 707,005
Int. Cl. B23p *11/02;* **B29c** *1/02, 1/04, 7/00;* **B44b** *5/02*
U.S. Cl. 264—102 **13 Claims**

There is disclosed a method for making rolls to produce a controlled surface finish upon synthetic thermoplastic sheet material wherein a female mold impression is produced from a male mold member having the desired peripheral surface configuration intended for the roll to be used in the process. After the female mold impression has been made by use of a curable synthetic plastic resin, a support member is inserted into the female mold and a synthetic plastic resin is cast on the surface thereof so as to form a male impression upon its peripheral surface conforming to that of the female mold. The synthetic plastic is then cured and the resultant roll is used as at least one of a pair of rolls operating upon the sur-



face of the heated thermoplastic sheet material so as to impress its surface characteristics thereupon.

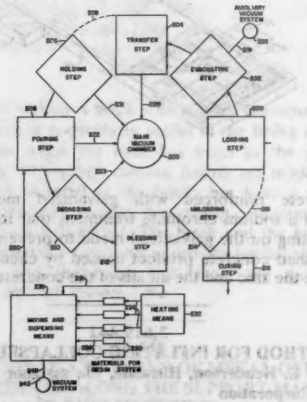
Although the surface of the roll may be mirror-polished in accordance with the disclosed procedure, generally the roll produced will have a multiplicity of cavities or protuberances thereon for embossing purposes.

3,619,447

CASTING METHODS FOR ENCAPSULATING ELECTRICAL CONDUCTORS

Bernard A. Kerns; Lawrence J. Manning, and Alexander Taleff, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

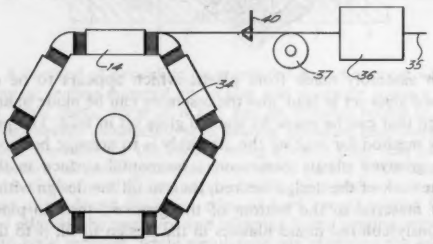
Division of Ser. No. 675,841, Oct. 17, 1967, Pat. No. 3,529,320.
Filed Jan. 21, 1970, Ser. No. 4,486
Int. Cl. B29c *6/02*
U.S. Cl. 264—102 **5 Claims**



Casting methods for at least partially encapsulating electrically conductive means in an insulating resin system. The casting methods include indexing a rotary carriage which contains a plurality of vacuum chambers, loading a casting mold at one of the index positions, evacuating the loaded vacuum chamber with a first vacuum system at another index position, transferring the vacuum chamber from the first

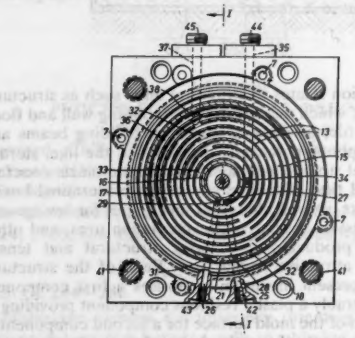
vacuum system to a second vacuum system, maintaining the vacuum provided by the second vacuum system at certain subsequent indexing positions, introducing a resin system into an evacuated vacuum chamber at one of the index positions at which the vacuum system is being maintained by the second vacuum system, to fill the mold contained therein, degassing the poured resin system at another of the index positions at which the vacuum is maintained by the second vacuum system, returning the vacuum chamber to atmospheric pressure at another index position, and unloading the filled mold at still another index position.

3,619,448
METHOD OF MAKING AN AEROFOIL-SHAPED BLADE
Jack Palfreyman, Matlock, Derby, and Henry Edward Middleton, Derby, both of England, assignors to Rolls-Royce Limited, Derby, England
Filed May 6, 1969, Ser. No. 822,259
Claims priority, application Great Britain, May 10, 1968, 22,298/68
Int. Cl. B29d *9/06;* **B29c** *27/26*
U.S. Cl. 264—103 **12 Claims**



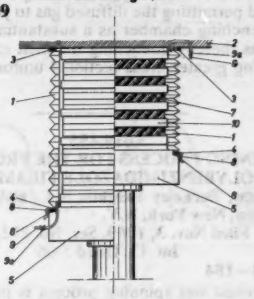
A method of making an aerofoil-shaped blade comprising positioning a pair of laminar members to provide a gap therebetween, the opposite sides of the blade profile being respectively provided on the said laminar members, thereafter winding fibrous material through the said gap, in a longitudinal direction with respect to the blade being formed and forming the assembly of laminar members and fibrous material into an aerofoil-shaped blade.

3,619,449
METHODS OF MANUFACTURING GRAMOPHONE RECORDS
Daniel Berard, Boulogne-sur-Seine, France, assignor to Les Industries Musicales et Electriques Pathe Marconi, Paris, France
Filed Nov. 22, 1967, Ser. No. 685,087
Claims priority, application France, Nov. 29, 1966, 85366
Int. Cl. B29d *17/00*
U.S. Cl. 264—106 **7 Claims**



In injection molding gramophone records, the material is injected into a cavity in which the region forming the transcription band is heated with a region around the periphery being cooled.

3,619,450
MAKING OF PRESSED BODIES
Laszlo Futo, Im Sommer 417, Klingnau, Switzerland
Filed Feb. 25, 1969, Ser. No. 802,133
Claims priority, application Switzerland, Feb. 27, 1968, 3023/68
Int. Cl. B29j *5/00*
U.S. Cl. 264—109 **1 Claim**

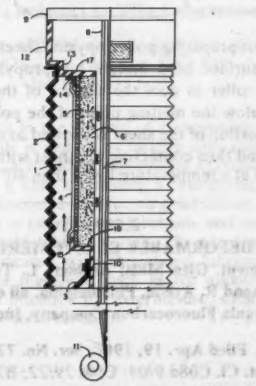


A method of making composite pressed bodies, such as panels. Material for making a composite pressed body is introduced into a tightly closable inner space. Pressing means is provided including two pressing members located in the inner space movable toward and away from one another, for exerting pressure on the material to convert the same into a composite pressed body. Means is provided which serves for regulating at the will of an operator the ambient atmosphere prevailing in the inner space.

3,619,451
POWDERED CELLULOSE ETHER
John Ernest Gill, Saltcoats, Scotland, assignor to Imperial Chemical Industries Limited, London, England
Filed Sept. 19, 1968, Ser. No. 761,002
Claims priority, application Great Britain, Sept. 29, 1967, Dec. 18, 1967, 44,477/67; 57369/67
Int. Cl. B29j *5/00*
U.S. Cl. 264—109 R **13 Claims**

There is provided a method of preparing free-flowing cellulose ether comprising in press rolls a dried particulate partially gelled cellulose ether at a pressure in excess of 3 tons total load per linear foot of roll at a feed rate such as to give flakes with a thickness of 0.003–0.015 inches.

3,619,452
FILAMENT QUENCHING APPARATUS AND PROCESS
David M. Harrison, Chester, and Thomas E. Miles, Richmond, both of Va., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 7, 1969, Ser. No. 805,261
Int. Cl. B28b *3/20;* **B29c** *25/00*
U.S. Cl. 264—176 F **26 Claims**



An apparatus and process for producing a substantially nonturbulent stream of cooling gas for quenching a melt ex-

truded filament which comprises a quenching chamber, wherein a melt extruded filament is passed therethrough, and a gas entry chamber, the gas entry chamber being provided with means for introducing a cooling gas. The quenching chamber and the gas entry chamber are separated from each other by a porous, multicellular, polymeric foam diffuser which is capable of diffusing gas entering from the gas entry chamber and permitting the diffused gas to pass therethrough into the quenching chamber as a substantially nonturbulent stream of gas thereby quenching the melt extruded filament and producing greater cross-sectional uniformity in the filament.

3,619,453

WET SPINNING PROCESS FOR THE PRODUCTION OF POLYBENZIMIDAZOLE FILAMENTS

John P. Riggs, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,670
Int. Cl. D01d *5/06*
U.S. Cl. 264—184 **15 Claims**

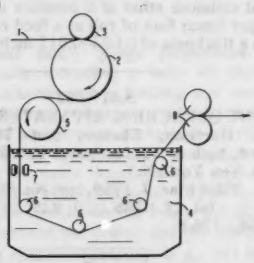
An improved wet spinning process is provided which is capable of producing highly uniform polybenzimidazole filaments which are substantially free of internal voids and radial incursions. A solution of the polybenzimidazole is extruded into a coagulation bath of certain polyhydroxy aliphatic alcohols to form an as-spun filament which is at least initially washed in a relatively cool wash medium, followed by drying, and stretching. The uniform filaments formed in the process are useful as precursors in the formation of carbon or graphite fibrous materials or as a substrate for metal deposition. When heavy denier filaments are formed in in the present process, these are particularly suited for use in the formation of fibrous closures.

3,619,454

METHOD OF PREPARING POLYPROPYLENE SHEET

Rikita Sakata, Yokkaichi-shi; Kohei Masuda, Masanori, Takashi, and Sadao Nagase, Yokkaichi-shi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1968, Ser. No. 771,027
Claims priority, application Japan, Oct. 27, 1967, 42/68820
Int. Cl. B29c *25/00*
U.S. Cl. 264—210 **4 Claims**



Method of preparing polypropylene sheets by contacting at least one surface of a molten polypropylene sheet with a quenching roller to cool the surface of the sheet to a temperature below the melting point of the polypropylene while the inner portion of the sheet is allowed to remain in the molten state, and then contacting the sheet with quenching water maintained at a temperature lower than 40° C.

3,619,455

HEAT DEFORMABLE ELASTOMERIC ARTICLES

Ira T. Clement, Glen Mills; Anthony L. Tuno, Philadelphia, and Edmond R. Ayella, Philadelphia, all of Pa., assignors to Pennsylvania Fluorocarbon Company, Inc., Clifton Heights, Pa.

Filed Apr. 19, 1968, Ser. No. 722,539
Int. Cl. C08d *9/04*; **C08f** *29/22*; **B29c** *13/00*
U.S. Cl. 264—230 **10 Claims**

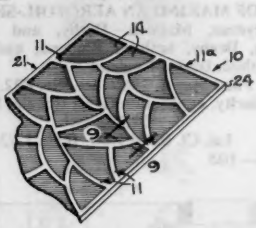
Elastomeric articles which can be shrunk by the application of heat are made from a blend of a cured polychloroprene elastomer and a polychloroprene elastomer having a Williams Plasticity Number of more than 1,000° at 100° F. and less than 350° at 150° F.

3,619,456

SIMULATED STAINED GLASS ASSEMBLY AND METHOD OF MAKING THE SAME

Charles L. Taylor, Jr., c/o Creative Concepts Co., 626 Second Ave., Dixon, Ill.

Filed Mar. 26, 1969, Ser. No. 810,742
Int. Cl. B29c *9/00*; **B44f** *1/00*
U.S. Cl. 264—245 **9 Claims**



An assembly made from plastic which appears to be of stained glass set in lead, and the assembly can be made in any design that can be made by stained glass set in lead. The primary method for making the assembly is to arrange horizontally grooved plastic cames on a horizontal surface in the framework of the design desired, then to fill the design with a filler material to the bottom of the grooves, then to place variously colored liquid plastics in the design to fill it to the top of the grooves, next to cure the plastic, and finally to remove the filler material. In one variation of the method, no filler material is used and the liquid plastic fills the design from the bottom of the cames to the top of the grooves. When this variation is used, the resulting assembly appears to be stained glass set in lead only when viewed from one side.

3,619,457

METHOD OF FORMING STRUCTURAL UNITS

Wesley M. Chandler, St. Paul; Paul F. Heuser, St. Paul, and Bernard T. Juba, White Bear Lakes, all of Minn., assignors to Thermoform Plastics, Inc., St. Paul, Minn.

Division of Ser. No. 625,244, Mar. 22, 1967, abandoned. Filed Sept. 20, 1968, Ser. No. 822,750
Int. Cl. B28b *1/16*
U.S. Cl. 264—256 **2 Claims**

This invention relates to structural units such as structural building units, which may be used for building wall and flood panels, floor tile, prestressed concrete, building beams and columns, telephone poles, guard poles, and the like, storage silos, chemical storage vats and tanks, septic tanks, concrete steps, railroad ties, telephone and telegraph terminal boxes, building blocks, shower stalls and tubs, pipes for sewage and water transmission, burial vaults, cremation urns, and other articles and products, of superior structural and tensile strength and attractive appearance. Each of the structural units of the present invention comprises a first component which is preferably a plastic resinous component providing at least a portion of the mold surface for a second component; a second component of portland cement concrete mix or lightweight aggregate cement mix, industrial molding plaster, or so-called "tooling plaster," or like materials, formed against the mold surface of the resin component; and an adhesive bonding agent between the mold surface of the first or resin component and the second concrete or molding plaster component formed thereon and cured in situ and adhesively

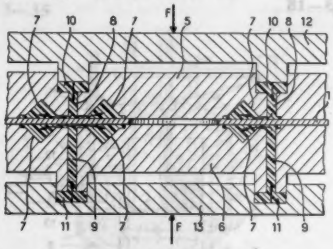
bonding the resin component and the concrete or molding plaster component together to form the said structural unit.

3,619,458

METHOD OF MAKING A GASKET

Jean Alfred Engelhardt, Lyon, France, assignor to Societe Anonyme dite: Cefilac, Paris, France

Continuation-in-part of application Ser. No. 475,111, July 25, 1965, now abandoned. This application Mar. 26, 1969, Ser. No. 814,231
Int. Cl. B29f *1/06*
U.S. Cl. 264—260 3 Claims



A method of providing an apertured gasket support with a ring of sealing material encircling said aperture, using a pair of mold parts, each of which has an annular recess in one face thereof connected to a sealing material reservoir, the inner diameter of the recess being greater than that of the aperture, according to which one mold part is positioned on each side of said gasket support with the recesses and aperture aligned and the inner edge of each recess spaced from the edge of the aperture and injecting liquid sealing material into both recesses, while simultaneously clamping the gasket support between the mold parts.

3,619,459

PROCESS FOR POTTING PLASTICIZED ACETYLATED CELLULOSE HOLLOW FIBER MEMBRANES

Paul G. Schrader, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 11, 1968, Ser. No. 736,012
Int. Cl. B29c *6/00, 27/30*
U.S. Cl. 264—262 5 Claims

An improved method for potting plasticized, acetylated cellulose hollow fibers with a thermosettable resin is disclosed wherein an improved bond between the cured resin and the fiber results when the resin comprises a mixture of the following components: a polyglycidyl ether of a polyhydric phenol, a reactive diluent, a polycarboxylic acid anhydride, a bond promoter, a thixotropic agent and a flexibilizing agent.

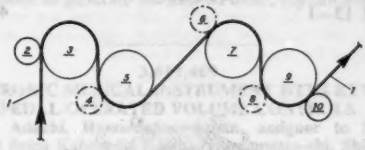
3,619,460

PROCESS FOR UNIAXIALLY ORIENTING POLYPROPYLENE FILMS

Leonard Chill, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of application Ser. No. 648,392, July 23, 1967, now abandoned , and a continuation-in-part of 552,523, Mar. 24, 1966, now abandoned. This application Apr. 28, 1969, Ser. No. 820,706
Int. Cl. B29d *7/24*
U.S. Cl. 264—288 6 Claims

Multistage process for uniaxially orienting stereoregular polypropylene film between rolls to ultimate draw ratios in the range of 6:1 up to fibrillation comprising in a first orientation stage adiabatically drawing cast film over a short linear path defined by the minimum tangential gap between a heated feed roll and a draw roll to a draw ratio of about 2:1 to 5:1 and in at least one additional orientation stage drawing



the film essentially isothermally to the ultimate draw ratio over a heated roll and between the heated roll and a draw roll over a partially arcuate path defined by the arc over which the film stretches on contact with the heated roll and the minimum tangential gap between the heated roll and draw roll.

3,619,461

STRETCHING PROCESS FOR POLYIMIDE FILM

Frank P. Gay, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 472,658, July 16, 1965, now abandoned. This application Mar. 25, 1969, Ser. No. 811,688
Int. Cl. B29d *7/24*
U.S. Cl. 264—288 2 Claims

A process of immersing in a volatile liquid a polyimide film of low volatile content, and heating and stretching or restraining the treated film to increase the orientation in at least one direction.

3,619,462

TABLETING LUBRICANT

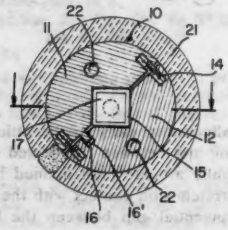
Allen I. Dines, Columbus, Ohio, and Willard Gene Brown, Stockton, Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 672,978, Oct. 5, 1967, Pat. No. 3,518,345. Filed Dec. 29, 1969, Ser. No. 1,925
Int. Cl. A61j *3/10*
U.S. Cl. 264—300 7 Claims

An improvement in the process of compressing powdered tabletable materials is gained by mixing with said materials prior to tableting, a lubricant comprising dry-mixable particles each having a core containing a lubricating oil and a coating of an oil-insoluble film-forming substance. The lubricant acts as both a punch face lubricant and as a diewall lubricant for said tabletable materials. The powdered tabletable materials lubricated with the above lubricant can be those intended for ingestion, such as for alkalizing of the stomach, or those intended for external use, such as for the general cleaning of solid surfaces.

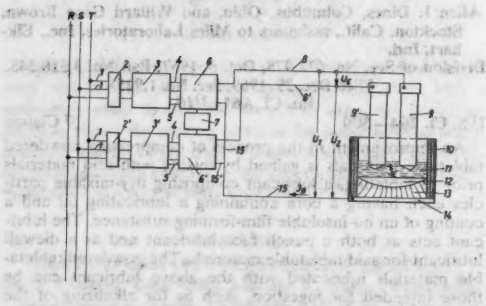
ELECTRICAL

3,619,463
HEATING FURNACE
Jean-Pierre Budin, Paris, and Jean Raffy, Crosnes, both of France, assignors to Compagnie Generale E'Electricite, Paris, France
Filed Dec. 20, 1970, Ser. No. 4,369
Claims priority, application France, Jan. 20, 1969, 69 00 965
Int. Cl. G01b *9/02*
U.S. Cl. 13—1 **4 Claims**



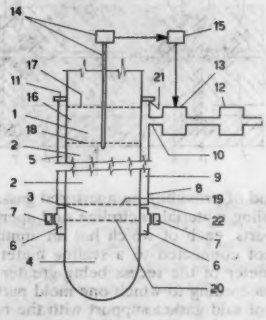
The coefficient of expansion and the thermal coefficient of the optical index in solids is measured by an interferential method employing a heating furnace consisting of two half-molds including heating elements. The half-molds are coupled together by elastic means acting perpendicularly to the axis of the half-molds which form a cylindrical housing open at both its ends.

3,619,464
APPARATUS FOR ELECTROSLAG REMELTING OF METALS AND IN PARTICULAR STEEL
Wolfgand Holzgruber, Kapfenberg; Peter Machner, Leoben; Wolfgang Hladny, Kapfenberg, and Otmar Kleinhagauer, Kapfenberg, all of Austria, assignors to Gebruder Boehler & Co. A. G., Kapfenberg, Austria
Filed Feb. 3, 1970, Ser. No. 8,379
Int. Cl. H05b *3/60*
U.S. Cl. 13—12 **3 Claims**



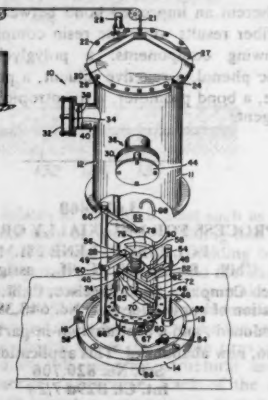
An apparatus for electroslag remelting metals, and in particular steels. Two electrodes or electrode groups are mounted in a mold containing a bath of liquid slag and are being fed with current via two or more thyristor circuits which supply the two electrodes or electrode groups with a single-phase alternating-current, the direction of which changes periodically.

3,619,465
METHOD FOR OPERATING SELF-BAKING ELECTRODES
Mario Cavigli, Mestre, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy
Filed Dec. 5, 1969, Ser. No. 882,811
Claims priority, application Italy, Dec. 9, 1968, 24,795 A/68
Int. Cl. H05b *7/06*
U.S. Cl. 13—18 **9 Claims**



Improved results in operating self-baking electrodes are achieved by surrounding that portion of the shell which contains the solid and the molten raw, electrode-forming paste, with a stream of a hot gas, while maintaining its temperature at at least the softening point of the raw paste.

3,619,466
RADIATION FURNACE
Thomas C. Athanis, 28 Shaw St., West Roxbury, Mass., assignor to Astreon Corporation, Lowell, Mass.
Filed Sept. 21, 1970, Ser. No. 73,866
Int. Cl. H05b *3/00*; F27d *1/00*; F27b *5/06*
U.S. Cl. 13—31 **11 Claims**



A high-temperature radiation furnace includes an aluminum cylindrical chamber, detachably clamped to an aluminum baseplate, there being gas conduits in the baseplate to supply positive or negative fluid pressure into the chamber and insulated electric conductors upstanding from the base plate to energize a resistance heating coil which encircles a workpiece. The housing cover is of easily rupturable material in case of overpressure and the heating coil is encircled by oppositely disposed, adjustable, radiation shields to restrict

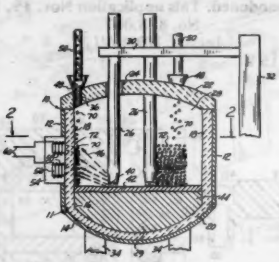
and reflect the heat. A variable speed motor-driven hoist is used for raising and lowering the chamber on the baseplate. A sealed vacuum port is provided in the baseplate for connection to a vacuum station.

3,619,467

ELECTRIC ARC FURNACE AND METHOD OF PROTECTING THE REFRACTORY LINING THEREOF

Daniel J. Goodman, 23236 Westbury Drive, St. Clair Shores, Mich.

Filed Apr. 23, 1970, Ser. No. 31,201
Int. Cl. F27d *1/00*
U.S. Cl. 13—35 **12 Claims**



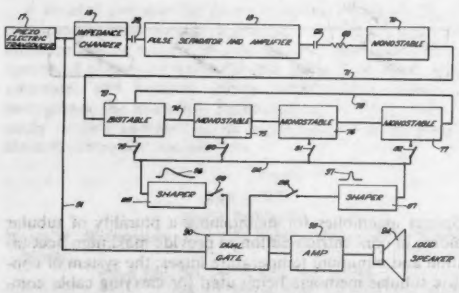
Damage to the lining of the shell of an electric arc furnace by arc flare during steel making is reduced by providing a powerful magnetic field in the vicinity of the lining sidewall area subjected to the intensive heat from arc flare and then feeding pieces, pellets or fragments of magnetically attracted ferrous material, such as iron ore or metal pieces, pellets or fragments past the magnetized lining area to the molten metal and slag bath in the bottom or hearth of the furnace. This magnetic flux causes the falling fragments, such as concentrated iron ore pellets, to be captured by and to adhere temporarily to the lining of the furnace until their temperatures reach the so-called Curie point of about 700° C. at which their capability of being magnetically attracted ceases. Thereupon the pellets fall into the molten bath but are immediately replaced by fresh pellets falling past the magnetized wall and thus providing a continuous shield of pellets or other magnetizable fragments which provide substantial protection to the sidewalls or lining of the furnace. The portions of the furnace between the electromagnets providing the magnetic flux and the furnace lining at the locations subjected to damaging arc flare are preferably formed of nonmagnetic material, so as to maintain the magnetix flux flow through the furnace wall and lining at its maximum value.

3,619,468

STRINGED MUSICAL INSTRUMENT WITH PIEZOELECTRIC TRANSDUCER PROVIDING GATE CONTROL AND MUSIC SIGNALS

Chauncey R. Evans, Costa Mesa, Calif., assignor to Columbia Broadcasting Systems, Inc., New York, N.Y.

Filed Mar. 5, 1970, Ser. No. 16,819
Int. Cl. G10h *3/00, 1/02*
U.S. Cl. 84—1.16 **31 Claims**



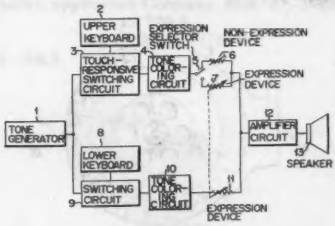
A method of creating a wide variety of player-initiated musical effects, which comprises employing a piezoelectric transducer in contact with the string of a guitar or similar plucked musical instrument, and thereby deriving from the string a control pulse upon each release of the string by the pick or fingers of the musician. The control pulse is utilized to control various gating and other means to create numerous rhythm, tonal and special effects. The apparatus comprises a string and associated piezoelectric transducer, in combination with an impedance changer for creating a very high output impedance for the transducer. Pulse separator and amplifier means are provided to separate the control pulse from the tone which is generated upon plucking of the string. Various monostable, bistable, shaper and gate means are provided to generate the desired tonal, rhythm and other effects.

3,619,469

ELECTRONIC MUSICAL INSTRUMENT WITH KEY AND PEDAL-OPERATED VOLUME CONTROLS

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Mar. 23, 1970, Ser. No. 21,796
Int. Cl. G10h *1/00, 1/02*
U.S. Cl. 84—1.17 **5 Claims**



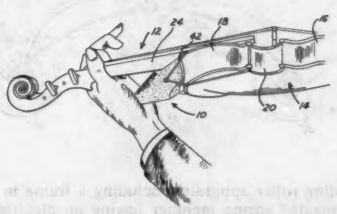
An electronic musical instrument comprises a first performance section which produces music signals by manipulation of keys in a keyboard at predetermined levels irresponsive to the forces with which the keys are depressed, a second performance section which produces music signals by manipulation of keys in a keyboard at levels responsive to the forces with which the keys are depressed, and expression control means which varies the signals from the first performance section under operation of the player, means to lead the signals from the second performance section to the output terminal of the expression control means, and an amplifier and a speaker to convert the signals from both sections into audible sound.

3,619,470

HAND-POSITIONING DEVICE FOR VIOLINISTS

George Dee Harris, Box 14, Butte Falls, Oreg.

Filed Apr. 3, 1970, Ser. No. 25,419
Int. Cl. G10d *3/18*
U.S. Cl. 84—281 **6 Claims**



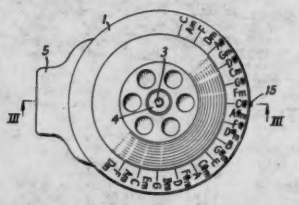
A hand-positioning device is provided for student violinists including particularly beginners, designed to assist them in maintaining a proper position and posture of the hand in which the violin is held, so that the finger tips of that hand may be caused and trained to move fluently and habitually

directly toward and from the strings, thereby to improve the technique generally, and particularly to facilitate the execution of the vibrato effect. The device has the following desirable characteristics: it abuts the outer end of the violin body, and straddles and substantially fits the neck anchor and a portion of the neck itself; it is yieldingly but firmly and stably held in place by elastic band means which extend around opposite sides of the outer end of the violin body and into the hollows or recesses provided at opposite sides of the waist portion; it is composed chiefly of very light, molded, nonresonant, cellular material such as styrofoam; it includes a hand engaging button or body of a dirt-resistant, cleanable material; it cannot be positively clamped in place and hence cannot crush the violin body, and it does not subject the violin to the hazard of mutilation in the event of accidental snagging of the device on a fixed object.

3,619,471
HARMONICAS

Shin-hua Tsui, Ming-Weng, 2nd Lane Hsin-Hsing, Taiwan, China

Filed Apr. 27, 1970, Ser. No. 31,989
Claims priority, application Great Britain, May 1, 1969, 22,378/69
Int. Cl. G10d 7/12
U.S. Cl. 84—377 **6 Claims**

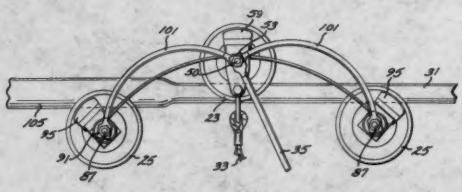


A round harmonica comprises a casing; a circular reed assembly mounted for rotation about its axis within the casing, the reed assembly having a number of circumferentially spaced reed chambers arranged so that any selected reed chamber, or group of reed chambers, is brought into alignment with at least one passage in the mouthpiece. The reed assembly is turned by hand by means of a driving gear coupled with a driven gear on the reed assembly, the gear ratio (preferably 2:1) being such that the reed assembly turns faster than the driving gear.

3,619,472
GROUNDING ROLLER

William R. Davis, Lakewood, Calif., assignor to Cunningham-Davis, Gardena, Calif.

Filed Feb. 25, 1970, Ser. No. 14,164
Int. Cl. H01r 3/00, 39/00; B60l 5/06
U.S. Cl. 174—5 SG **9 Claims**

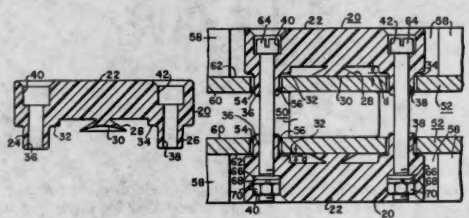


Grounding roller apparatus including a frame in the form of an elongated spring member having an electrically conductive central roller mounted thereon and an outside electrically conductive roller disposed on either side thereof in spaced relationship therewith and also mounted on the frame. Thus, Thus, the central roller may be placed on an electrical conductor and the opposite ends of the frame flexed to engage the outer rollers on the underside of the conductor and the entire apparatus grounded whereby the conductor may be fed through the apparatus thereby providing a constant ground for the conductor.

3,619,473
CLAMPING BRACKET FOR FLAT PACKAGE SEMICONDUCTOR DEVICES AND A SEMICONDUCTOR ASSEMBLY UTILIZING THE SAME

Alfred Meyerhoff, Greensburg; Peter M. Guzanick, Monroeville, and Walter E. Blake, Jeannette, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 700,940, Jan. 26, 1968, now abandoned. This application Nov. 19, 1969, Ser. No. 878,067
Int. Cl. H01l 1/12
U.S. Cl. 174—15 R **28 Claims**

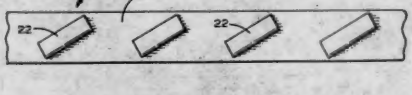


The invention relates to a mounting bracket and to an assembly for a flat-packaged semiconductor device. The primary purpose of the bracket and assembly is to apply the contacting force to a semiconductor device without distorting or bending the contacting surfaces. The mounting bracket has two spaced-apart bosses which project into apertures of each member. The boss prevents electrical short circuiting from occurring between fasteners, required to clamp the components together, and the members. The bracket has a pressure contact which may be integral with, or separate from, the assembly. The pressure contact may have either a concave flexible face or a flat face for distributing the force of the bracket to a surface of member that it is mounted on.

3,619,474
SPACER ASSEMBLY FOR COAXIAL TUBULAR SYSTEMS

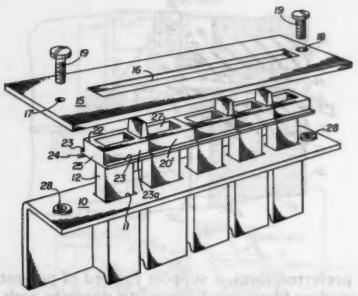
August Beck, Langenhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed May 28, 1969, Ser. No. 828,481
Claims priority, application Germany, June 1, 1968, P 17 65 532.2
Int. Cl. H01b 9/04
U.S. Cl. 174—29 **10 Claims**



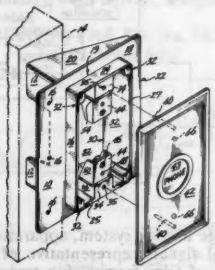
Spacer assemblies for maintaining a plurality of tubular members in concentric relation to provide maximum heat insulation and minimum temperature losses; the system of concentric tubular members being used for carrying cable components under supercooled conditions or transmitting liquids or gases under predetermined temperature conditions.

3,619,475
ESCUTCHEON MODULE
James R. Bailey, Chicago, Ill., assignor to Switchcraft, Inc., Cook County, Ill.
Filed Apr. 23, 1970, Ser. No. 31,302
Int. Cl. H05k 5/03
U.S. Cl. 174—53 3 Claims



This invention provides an escutcheon module for framing individual pushbuttons in a panel window. A module provides a frame about each pushbutton with the bottom of such module being caught at the inside surface of a panel upon which a pushbutton device is mounted and through which individual pushbuttons may project.

3,619,476
WALL OUTLET RECEPTACLE
Harry R. Rasmussen, 422 Fife Heights Drive N.E., Tacoma, Wash.
Filed Feb. 2, 1970, Ser. No. 7,612
Int. Cl. H02g 3/12
U.S. Cl. 174—58 3 Claims



A molded-polymer outlet receptacle for low-voltage electrical and communication systems has L-shaped structure to embrace and be secured to a structural element of a wall. An apertured plate is cantilevered into space from said L-shaped structure, and buttress means therebetween stiffens and strengthens the assembly. Instanding ears in said plate variously receive and secure an escutcheon, and on occasion electric connector components.

3,619,477
ESCUTCHEON
Harry R. Rasmussen, 422 Fife Heights Drive N.E., Tacoma, Wash.
Filed Jan. 26, 1970, Ser. No. 5,815
Int. Cl. H02g 3/14
U.S. Cl. 174—66 2 Claims

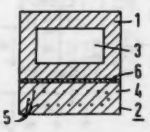
An escutcheon to cover an electrical outlet receptacle has a pair of rear standing studs to be manually engaged to and

disengaged from a pair of pin-receiving openings in such a receptacle.

3,619,478
ELECTRICAL CONNECTING ELEMENT
Bruno Staiger, Erligheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,588
Claims priority, application Germany, Mar. 27, 1969, P 19 15 780.3
Int. Cl. H05k 1/18
U.S. Cl. 174—68.5 1 Claim

The electrical connecting element consists of a flanged sleeve which is pushed over the terminal pins, establishing the electrical contact between a terminal pin and a printed circuit. The element is applied in a form- and force-locking manner, and is protected against external influences, such as dust and vibration, by means of a shrink-on ring.

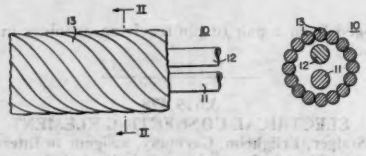
3,619,479
ELECTRICAL CONDUCTOR OF ELECTRICALLY NORMAL CONDUCTING METAL AND SUPERCONDUCTING MATERIAL
Gunther Bogner, Tennenlohe, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed June 17, 1970, Ser. No. 46,997
Claims priority, application Germany, June 25, 1969, P 19 32 086.6
Int. Cl. H01b 5/00, 7/34
U.S. Cl. 174—126 16 Claims



A tubular conductor of electrically normal conducting metal has an outside rectangular configuration having a plurality of external surfaces. A tape-shaped conductor affixed to the tubular conductor at an external surface thereof comprises electrically normal conducting metal and wires of superconducting material embedded in the normal conducting metal and twisted about the longitudinal axis of the tape-

shaped conductor. The tubular conductor is electrically normal conducting at the operating temperature at the superconducting material.

3,619,480
SELF-DAMPING CABLE
Mark A. Baker, Potsdam, and Charles B. Rawlins, Massena, both of N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Sept. 8, 1970, Ser. No. 70,395
Int. Cl. H01b 5/00; H02g 7/14
U.S. Cl. 174—130 6 Claims

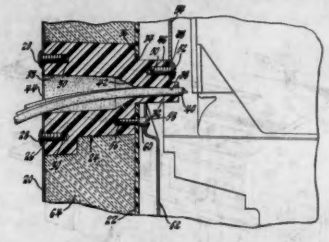


A self-damping electrical conductor for suspension between spaced supports, the conductor including a hollow conductive mantle and a conductive core loosely disposed therein. The conductive core comprises at least two substantially straight conductors extending through the mantle in essentially parallel relationship to the longitudinal axis thereof, and loosely disposed with respect to each other and to the mantle. The conductive mantle and the core conductors have several different combinations of stress-strain characteristics, density, and coefficient of thermal expansion, such that the core conductors inherently seek different sags when the mantle and core are suspended under tension between supports.

3,619,481
ENCLOSURE FOR AN ELECTRICAL CABLE SPLICE
Donald J. Smith, Canoga Park, Calif., assignor to Smith-Schreyer & Assoc., Inc.
Division of Ser. No. 615,718, Feb. 13, 1967, Pat. No. 3,499,972.
Filed Oct. 13, 1969, Ser. No. 871,030
Int. Cl. H01r 13/16; H02g 15/08
U.S. Cl. 174—138 F 3 Claims

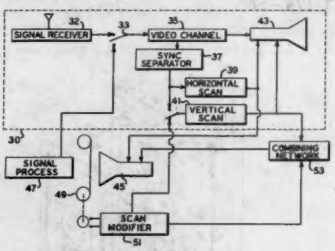
An enclosure for a cable splice in which a sheet of flexible material bearing a porous spacer mat is provided with rigid but deformable bars along its sides so that when the sheet of material is folded around the cables the bars provide a rigid support. The bars are deformable so that the centers thereof can be moved apart to form an opening to receive a charge of encapsulating resin and can then be reformed and fastened together to seal the enclosure.

3,619,482
COMBINATION STRUCTURAL SUPPORT AND ELECTRICAL DUCT
Roger M. Boor, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 9, 1970, Ser. No. 17,508
Int. Cl. H01b 17/58
U.S. Cl. 174—152 G 2 Claims



In the preferred form, a support formed of polyester resin containing glass fibers has fastened to opposite ends thereof an outer sheet metal wall and an inner plastic liner of a refrigerator. The support has a protrusion extending through an opening in the liner containing a wide flat passage therein and an external flat surface to which is fastened another sheet metal wall spaced from the liner. The wide flat passage broadens as it extends from the liner to an outer wall which has an opening of similar size. Electrical conductors extend through the passage to the interior of the refrigerator.

3,619,483
CONTINUOUS ELECTRONIC FILM SCANNER
Wendell K. Boots, and William D. Murphy, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated
Filed Feb. 13, 1970, Ser. No. 11,065
Int. Cl. H04n 9/02, 5/86
U.S. Cl. 178—5.2 D 9 Claims

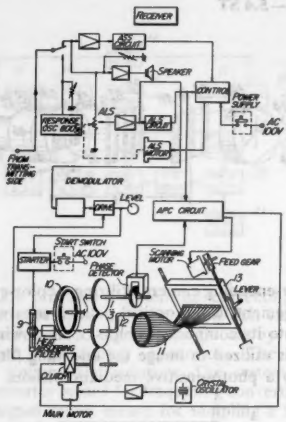


In a visual image display system, apparatus is included for deriving electrical signals representative of image information from a film of film frames, for transporting the film frames through a scanning zone at a predetermined film frame repetition rate, and for effecting continuous modification of electron beam scanning of the film frames at a rate substantially equal to the repetitive rate of film frame movement through the scanning zone.

3,619,484
A COLOR FACSIMILE SCANNING SYSTEM
Yutaka Tanaka, Chofu-shi, and Koichi Kobitsu, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan and Matsushita Graphic Communication System, Inc., Tokyo, Japan
Filed May 20, 1969, Ser. No. 826,129
Claims priority, application Japan, June 4, 1968, May 24, 1968; 43/38936, 43/43738
Int. Cl. H04n 1/06
U.S. Cl. 178—5.2 R 4 Claims

A color facsimile system wherein, in its receiving side, each of the color signals R, G and B (red, green and blue

respectively) is received to vary the intensity of a light radiated from a light source depending on the intensity thereof, then, through a circular to linear scanning conversion device employing optical fibers, the above-mentioned light is scanned in a plane scanning system to be recorded on a recording material moving in the direction (an auxiliary scanning direction) perpendicular to the linearly arranged

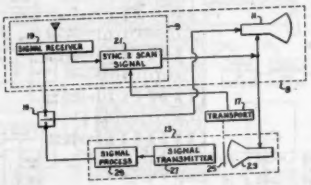


portion of the optical fibers thereby, performing color reproduction through reception scanning by partly overlapping scanning lines two thereof over the other, also having compatibility for receiving black-and-white signals, furthermore comprising a mechanism to hold the recording material at a constant position while the auxiliary scanning is being carried out.

3,619,485
TELEVISION AND SCANNED FILM COLOR IMAGE DISPLAY SYSTEM

Donald John Cross, Tonawanda, and Robert Roy Eckenbrecht, East Bethany, both of N.Y., assignors to G.T.E. Sylvania Incorporated

Filed Dec. 30, 1968, Ser. No. 787,880
Int. Cl. H04n 9/02
U.S. Cl. 178—5.2 R **4 Claims**

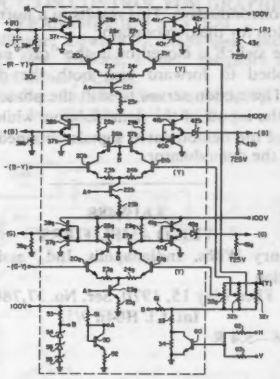


A system for providing a color image display derived from color television signals and photographic film includes a color image reproducer; first signal source means responsive to color television signal to provide signals representative of luminance, chrominance and synchronizing information; second signal source means responsive to light-scanned photographic film to provide signals representative of luminance and chrominance information; transport means for effecting conveyance of a film through said second signal source means and synchronization of said film conveyance and said first signal source means; and switching means for selective coupling of signals representative of luminance and chrominance information from said first and second signal source means to said color image reproducer.

3,619,486
MATRIX AMPLIFIER FOR DEVELOPING PUSH-PULL COLOR CONTROL SIGNALS

George J. Tzakis, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 26, 1969, Ser. No. 853,156
Int. Cl. H04n 9/52
U.S. Cl. 178—5.4 MA **9 Claims**

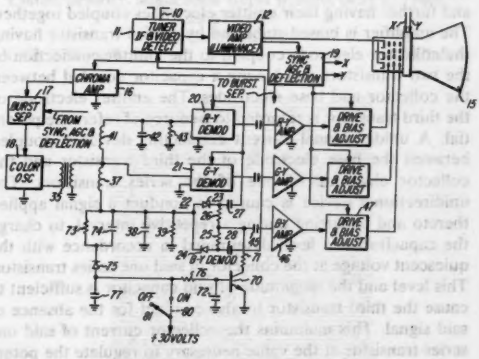


A monolithic structure includes three transistorized differential amplifiers having a common bias network so that they all conduct the same amount of current. An additional pair of transistors connects with each of those amplifiers in cascode fashion and a color-difference signal is applied to one side of each differential amplifier while the luminance signal is applied to the opposite side with such polarity that push-pull primary color signals are developed at the outputs of the cascode circuits for application to a color picture tube. Retrace blanking pulses are applied along with the luminance signal to accomplish retrace blockout.

3,619,487
SELECTIVELY OPERATED TINT CORRECTION CIRCUIT

Ronald Richard Norley, and Robert Dale Altmanshofer, both of Indianapolis, Ind., assignors to RCA Corporation

Filed May 11, 1970, Ser. No. 36,045
Int. Cl. H04n 9/50
U.S. Cl. 178—5.4 HE **9 Claims**



A tint correction circuit utilizes a unidirectional current conducting device which is coupled to the input of a demodulator circuit, and a transistor whose collector electrode is coupled through a resistive impedance to the output

terminal of the demodulator. The anode of the diode and the base electrode of the transistor are coupled together through a suitable impedance to which is also coupled a switch. The cathode of the diode is returned to reference potential through a capacitor.

During a first mode of operation, with the switch in the "off" position, the diode rectifies certain polarity AC signals applied to the input of the demodulator and produces a DC voltage across the capacitor. This DC voltage renders the transistor nonconductive. This results in a normal demodulation operation for the demodulator.

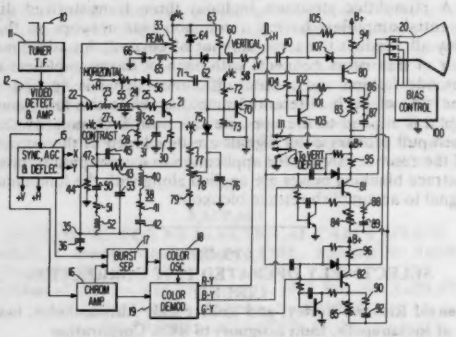
When the switch is closed or in the "on" position, a voltage is applied to forward bias both the diode and the transistor. This action serves to shift the phase of the signals applied to the inputs of the demodulators while reducing the amplitude of the demodulated signals obtained at the output terminal of the demodulator.

3,619,488

VIDEO AMPLIFIERS

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation

Filed May 15, 1970, Ser. No. 37,780
Int. Cl. H04n 9/52
U.S. Cl. 178—5.4 R **5 Claims**



A video amplifier, for driving a kinescope, employs two transistors of opposite conductivity arranged in a series path and further having their emitter electrodes coupled together. The amplifier is biased stabilized by a third transistor having the collector electrode coupled to the emitter connection of the two transistors and having a capacitor coupled between the collector and base electrodes. The emitter electrode of the third transistor is returned to a source of reference potential. A unidirectional current conducting device is coupled between the base electrode of the third transistor and the collector electrode of one of the series transistors. The unidirectional device is caused to conduct a signal applied thereto and occurring during a repetitive interval, to charge the capacitor to a level determined in accordance with the quiescent voltage at the collector of said one series transistor. This level and the magnitude of said capacitor is sufficient to cause the third transistor to also conduct for the absence of said signal. This maintains the collector current of said one series transistor at the value necessary to regulate the potential at the collector electrode thereof.

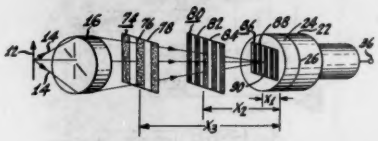
A further transistor stage provides peaking, contrast control and blanking functions for the video amplifier, as described above, by operating on the luminance component of the composite signal for application thereto to the base electrode of the other one of said series transistors.

3,619,489

SHADOWING SYSTEM FOR COLOR ENCODING CAMERA

Hugh F. Frohbach, Sunnyvale; Albert Macovski, Palo Alto, and Philip J. Rice, Atherton, all of Calif., assignors to RCA Corporation

Filed Feb. 12, 1969, Ser. No. 798,677
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST **9 Claims**



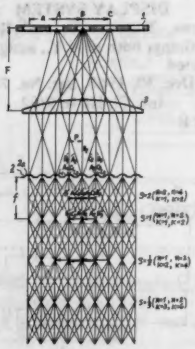
In a color-encoding camera utilizing a color-encoding strip filter arrangement in the optical path to separate light from an object into its component colors, a shadowing grating arrangement is utilized to image the encoding filter strips efficiently onto a photosensitive medium without the use of a relay lens.

3,619,490

COLOR IMAGE PICKUP DEVICE

Setsuo Usui, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 28, 1969, Ser. No. 803,388
Claims priority, application Japan, Mar. 1, 1968, 43/13268
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST **4 Claims**



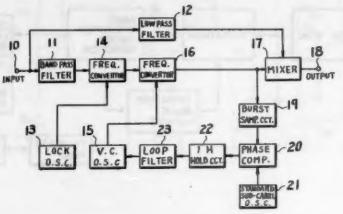
In a color image pickup device a banded color filter and a lens screen are interposed between an object to be televised and the photosensitive conversion layer of an image pickup tube to provide a striped color-separated image of the object on the photosensitive layer, with the color filter at a finite distance in front of the lens screen and with the distance from the lens screen to the layer being selected in relation to such finite distance, the pitch of the lens elements making up the lens screen and the pitch of the filter elements of the banded color filter, so that images of the color filter are overlappingly projected on the photosensitive conversion layer for optimum brightness and contrast of the reproduced picture.

3,619,491

SYSTEM FOR CORRECTING THE PHASE OF A CARRIER CHROMA SIGNAL

Mitsuo Fujita, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama, Japan

Filed Oct. 1, 1969, Ser. No. 862,708
Claims priority, application Japan, Oct. 3, 1968, 43/71731
Int. Cl. H04n 5/76, 9/46, 5/21
U.S. Cl. 178—5.4 CD 6 Claims



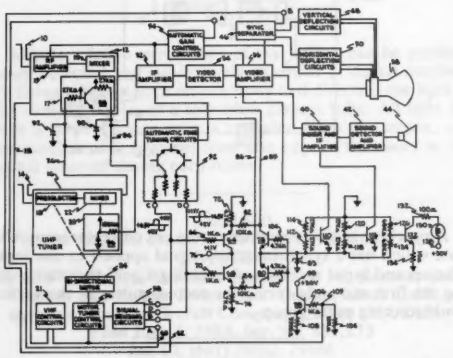
The invention provides a system for correcting the phase of a carrier chroma signal having a timing axis variation contained in a color video signal reproduced by a magnetic recording and reproducing apparatus. The correction removes the timing axis variation. The system comprises frequency converter means for frequency converting the carrier chroma signal twice, means for sampling a burst signal from the output of said second frequency converter means, a phase comparator for comparing the phase of the burst signal with the phase of the output of a reference subcarrier oscillator, and voltage control oscillator means adapted to be controlled by the output of said phase comparator to oscillate and produce an output which is fed back to said frequency converter means.

3,619,492

AUTOMATIC FINE TUNING CIRCUITRY

Wayne Wheeler Evans, Indianapolis, Ind., assignor to RCA Corporation

Filed June 2, 1969, Ser. No. 829,191
Int. Cl. H04n 5/44, 5/60
U.S. Cl. 178—5.8 R 22 Claims



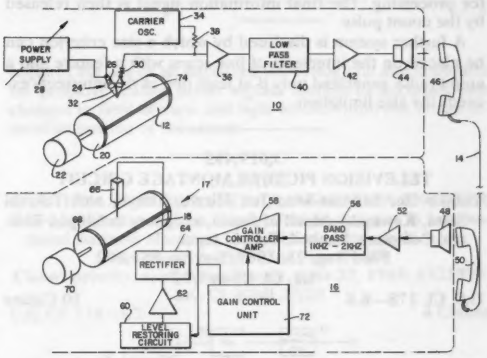
A television system includes means for disabling the application of an automatic fine tuning correction voltage to the television tuner while the tuner's tunable resonant circuits are being adjusted to tune from a first to a second frequency during channel change. During this period, the disabling means establishes a voltage across a variable capacitance device in the tuner's oscillator tunable resonant circuit to approximate the crossover frequency voltages normally applied to the device from the automatic fine tuning circuits. The automatic fine tuning circuit operation is not affected during channel change, and the correction voltage output signals may be employed in a signal seeking system to help detect the presence of a desired television signal. Whenever the disabling means becomes operative, it actuates other circuitry to cause a muting of the television video and sound signals to occur, as well as the energization of a channel change indicator.

3,619,493

AUTOMATIC GAIN CONTROL FOR GRAPHIC DATA TRANSMISSION SYSTEM

Robert E. Krallinger; Edward G. Keplinger, and Jerry W. Terrell, all of New Milford, Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Filed Dec. 20, 1968, Ser. No. 785,495
Int. Cl. H04n 1/32, 1/06
U.S. Cl. 178—6 14 Claims



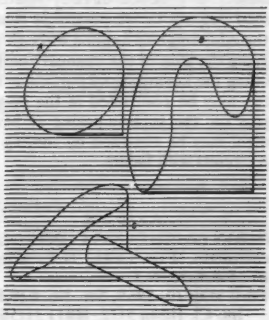
A facsimile transmission system in which the content of an original document is transmitted by means of an amplitude modulated carrier includes a transmitter that periodically transmits a gain standardizing signal having a predetermined level relative to a given document tone. The receiver includes a gain control circuit that responds selectively to the gain standardizing signal by charging or discharging a storage capacitor to a control voltage that controls the receiver gain so as to provide a standard input voltage for a printer that prints a facsimile of the original document.

3,619,494

COUNTING SYSTEMS IN IMAGE ANALYSIS EMPLOYING LINE SCANNING TECHNIQUES

Colin Fisher, Meldreth, Royston, England, assignor to Metals Research Limited, Melbourn, Royston, England

Filed Apr. 29, 1969, Ser. No. 820,180
Claims priority, application Great Britain, May 1, 1968, 20,613/68
Int. Cl. H04h 7/02
U.S. Cl. 178—6.8 35 Claims



Systems for counting features in image analysis systems employing line scanning in which a single pulse is generated

and the end of the scan of each feature. Information associated with each feature can also be retained for release at the same instant as the count pulse. In some systems means are provided for advancing information in the frame scan direction against the line scan direction to thereby advance the instant at which information is available in the next line subject to the local shape of the feature. The preferred feature of such systems is a degree of option whereby the circuit can select the best of a number of alternative time intervals by which information can be advanced so as to reduce the area of paralysis beyond the feature in the line scan direction.

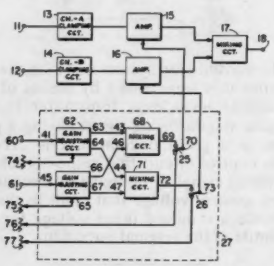
A system is disclosed for producing a signal having a parameter whose value is representative of one or more geometrical properties of a feature under analysis in which increments of information are obtained from each line scan intersecting the feature and accumulated in a memory device for processing. The final information signal is then released by the count pulse.

A further system is disclosed by which a size criterion can be placed on the intersects of line scans with a feature and a count pulse generated only if at least one of the intersects exceeds the size limitation.

3,619,495
TELEVISION PICTURE MONTAGE CIRCUIT

Yutaka Ito, Saitama-ken; Jun Hirate, Tokyo, and Takeshi Saito, Kawasaki-shi, all of Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 21, 1969, Ser. No. 851,802
Int. Cl. H04n *5/22*
U.S. Cl. 178—6.8 **10 Claims**



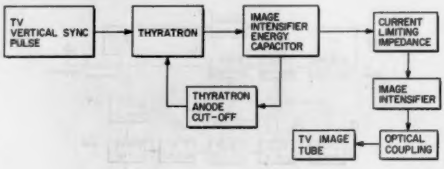
A method and apparatus are described for the preparation of a common television program signal from different line scan signals. Line scan signals are generated such as of the conventional video type employed in the transmission of television programs. Each line scan signal has a like period and is applied along different channels for combination after passing through variable gain channel amplifiers. Control voltages are generated for the gain control of the channel amplifiers. The control voltages are produced from a keying signal and a composite keying signal which pass through variable gain circuits to produce directly related and complementary related outputs. Correspondingly related outputs are added with the added signals applied through a switching network for varying the gain of the channel amplifiers. By selectively controlling the keying signal particular time portions of each line scan may be controlled in the common television program signal for the superimposing of several programs. Gradual control may be obtained by varying the gain of the variable gain circuits with faders.

3,619,496
TELEVISION BRIGHTNESS CONTROL SYSTEM

Bernard Lichtenstein, Fair Lawn, N.J., assignor to Ocean Metrics, Inc., Fairfield, N.J.

Filed May 29, 1969, Ser. No. 828,838
Int. Cl. H04n *5/72*; **H01j** *31/50*
U.S. Cl. 178—7.3 D **1 Claim**

A circuit arrangement for providing an output image of constant brightness on the television tube image of a television receiving system over a wide range of illuminations. The system comprises image intensifier means coupled to the television image tube, and a current limiting impedance on the input side thereof. Feeding a control signal to the image intensifier means across the current limiting impedance is a thyratron means, e.g., a thyratron tube or SCR transistors. The control electrode of the thyratron means serves to

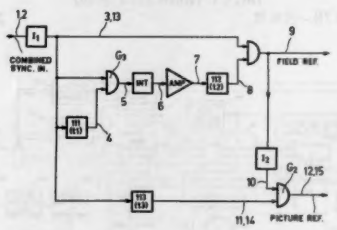


receive a sync pulse. In parallel with said thyratron means and said current limiting impedance is a capacitor disposed to charge when the control electrode maintains the thyratron means in a nonconductive state, the capacitor means controlling the thyratron means anode electrode. A diode is interposed between the thyratron cathode and the capacitor to prevent feedback into the thyratron means cathode.

3,619,497
FIELD AND PICTURE SYNCHRONIZING PULSE SEPARATORS

Richard John Godwin Ellis, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed Aug. 28, 1969, Ser. No. 853,667
Claims priority, application Great Britain, Aug. 28, 1968, 41,056/68
Int. Cl. H04n *5/04*
U.S. Cl. 178—7.3 S **8 Claims**



A synchronization signal separator circuit features an AND gate which has a synchronization signal applied to one input. The second input receives an enabling signal that starts during the first and ends during the second pulses of the vertical synchronizing pulse group.

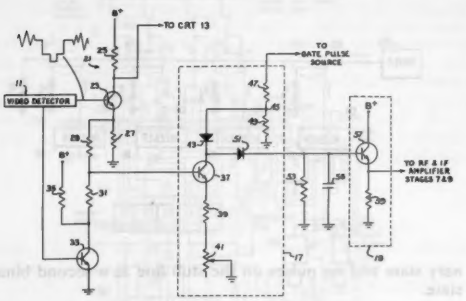
3,619,498
KEYED AUTOMATIC GAIN CONTROL CIRCUITRY

Dong Woo Rhee, Williamsville, N.Y., assignor to Sylvania Electric Products, Inc.

Filed Apr. 1, 1969, Ser. No. 822,787
Int. Cl. H04n *5/56*
U.S. Cl. 178—7.3 DC **10 Claims**

A signal receiver includes gated automatic gain control (AGC) circuitry having an amplifier stage coupled by a first unidirectional conduction device to a gate pulse signal source and by a second unidirectional conduction device to RF and IF amplifier stages whereby the first unidirectional conduction device prevents ringing in the gate pulse signal source

from affecting the AGC action and the second unidirectional conduction device tends to sustain a substantially constant level of AGC signal intermediate the period of gated pulse signal application.

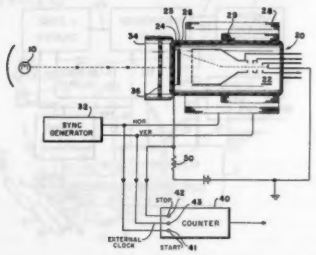


3,619,499

TELEVISION SURVEYING SYSTEM FOR MEASURING MINUTE DISPLACEMENTS

Edward A. Petrocelli, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 4, 1970, Ser. No. 8,570
Int. Cl. H01j *29/89*
U.S. Cl. 178—7.85 **1 Claim**



Minute relative movements of two bodies can be continuously detected and quantatively recorded in digital numbers by fixing a light source on one body and directing the light to the viewing screen of a television camera tube. All light except a small discrete spot is excluded from the screen, and the number of lines swept from one edge of the raster to the spot is counted during each frame.

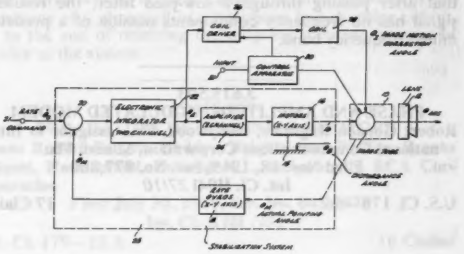
3,619,500

ELECTRONIC IMAGE MOTION STABILIZATION SYSTEM

Richard F. Bouley, Hermosa Beach; Jay M. Hansen, Santa Monica, and Robert Zwirn, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 4, 1969, Ser. No. 831,273
Int. Cl. H01j *29/02, 29/86*
U.S. Cl. 178—7.8 **8 Claims**

The apparatus of the present invention provides image motion stabilization of a displayed scene generated by a lens system on a transportable body for apparent line-of-sight motions that occur from coupled vehicle body motions and also to provide accurate pointing commands with respect to the displayed line-of-sight. In implementing the system, a single set of gyros is used as a sensor to provide a feed forward image motion correction signal, as well as a sensor motion feedback signal. This feedback signal is summed with a rate command to form an error voltage which causes the sensor to the slewed to the desired position at the commanded rate. The addition of this feedback loop with the image motion compensation error sensor provides a substantial reduction of the image motion correction angle and concomitant pointing error during slewing that is limited only by the servo bandwidth. In addition to the foregoing, implementation also requires the use of an improved deflection coil and apparatus for properly scaling driver signals thereto to accommodate changes in field-of-view and light levels within the image intensifier portion of the sensor.

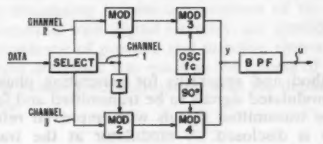


3,619,501

MULTIPHASE MODULATED TRANSMISSION ENCODER

Henri J. Nussbaumer, La Gaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 18, 1970, Ser. No. 47,406
Claims priority, application France, June 27, 1969, 6921899
Int. Cl. H04l *27/20*
U.S. Cl. 178—67 **4 Claims**



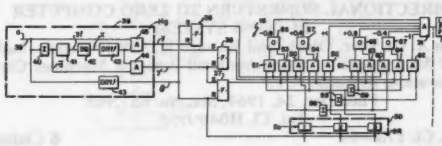
A multiphase modulated transmission can be obtained with three data sets X, Y, and Z such that data elements of the set Y+Z drive two phase channels and data elements from the set Y^1+Z^1, derived from the three sets X, Y, Z and selected according to a predetermined logical function, drive two other phase channels. By adjusting the weighting of algebraic adders terminating corresponding channel pairs, multiphases up to eight can be approximated.

3,619,502

PROCESS FOR DIRECTLY GENERATING A DATA REPRESENTING SIGNAL HAVING ITS MAIN COMPONENTS IN ONE FREQUENCY OCTAVE

Alain Croisier, Cagnes sur Mer, and Henri Jean Nussbaumer, La Gaude, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1969, Ser. No. 855,010
Claims priority, application France, Sept. 4, 1968, 009409
Int. Cl. H04l *27/24*
U.S. Cl. 178—67 **5 Claims**



A method for directly generating a data representing signal corresponding to a single sideband of a data modulated carri-

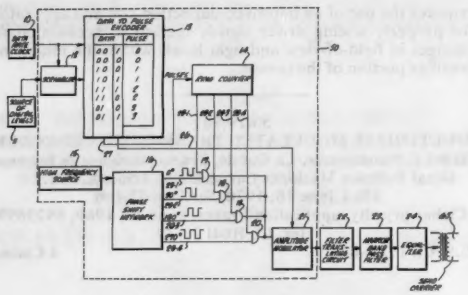
er signal and suitable for transmission over a limited frequency network. The signal comprises the summation of a number of bit representing pulse sequences, each sequence including a central bit indicating pulse and both preceding and following echo pulses. The pulses are generated by digital techniques and their spacing and amplitude are so selected that after passing through a low-pass filter, the resultant signal has no frequency components outside of a predetermined frequency band.

3,619,503

PHASE AND AMPLITUDE MODULATED MODEM

Robert Gordon Ragsdale, Hollywood, Fla., assignor to International Communications Corporation, Miami, Fla.

Filed Nov. 18, 1969, Ser. No. 877,880
Int. Cl. H04l *27/10*
U.S. Cl. 178—66 **17 Claims**



A method and apparatus for generating phase and amplitude modulated signals to be transmitted and for demodulating the transmitted signals with improved reliability and accuracy is disclosed. A modulator at the transmitter is adapted to continuously group digital data into multibit words of equal length. The modulator is responsive to predetermined multibit subgroups within each multibit word to differentially phase modulate a carrier signal during successive modulation periods. The modulator is further responsive to the remaining bits within each multibit word to amplitude modulate the carrier signal during successive modulation periods. A demodulator is provided at the receiver. A differential phase detection portion of the demodulator reconstitutes the multibit subgroup digital data phase encoded at the modulator. A variable gain amplifier at the receiver varies the amplitude of the received signal in accordance with derived gain selection commands. The gain selection commands are derived from an amplitude detection portion of the receiver. The amplitude detection portion also provides a digital output indicative of the remaining portion of the multibit words originally encoded. The derived gain selection commands vary the gain of the receiver amplifier to cause the output amplitude levels of the amplifier to accurately correspond to the originally encoded amplitude levels. The accurately corresponded amplitude levels insure correct amplitude detection at the receiver.

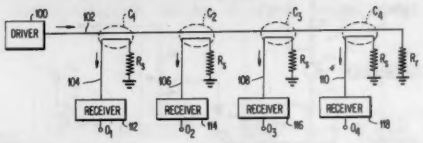
3,619,504

DIRECTIONAL NONRETURN TO ZERO COMPUTER BUSSING SYSTEM

John A. De Veer, Olney, and Howard H. Nick, Potomac, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,965
Int. Cl. H04b *1/58*
U.S. Cl. 178—68 **6 Claims**

A high-speed data transmission network employing data representations as changes in voltage along a transmission line. Directional coupling elements are spaced along the transmission line to couple information from the transmission line to stub lines. Each stub line is connected to a receiver circuit designed to interpret pulses on the stub line as one binary state and no pulses on the stub line as a second binary state.

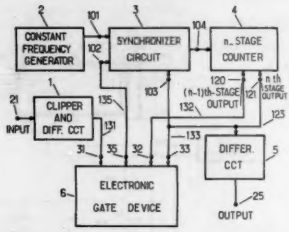


3,619,505

CLOCK PULSE DIGITAL SYNCHRONIZATION DEVICE FOR RECEIVING ISOCHRONOUS BINARY CODED SIGNALS

Jacques K. Melle, Paris, France, assignor to Lignes Telegraphiques et Telephoniques, Paris, France

Filed July 20, 1970, Ser. No. 56,432
Claims priority, application France, July 25, 1969, 6,925,411
Int. Cl. H04l *7/00, 7/02*
U.S. Cl. 178—69.5 R **5 Claims**



A device for the synchronization of a clock pulse generator located in a receiving equipment for isochronous binary pulses, comprising means for deriving a brief control pulse from each transition in the received modulation, a local periodic pulse generator having a repetition rate equal to an integral multiple of the modulation speed, a synchronizing circuit receiving said periodic pulses and brief control pulses and delivering pulses to the input of a binary counter, said circuit having an extra input fed from the output stage of said counter, and electronic gate means controlling the transmission of said brief control pulses to said synchronization circuit and themselves controlled by the two last stages of said counter, whereby control of said clock pulse generator by untimely control pulses is prevented.

3,619,506

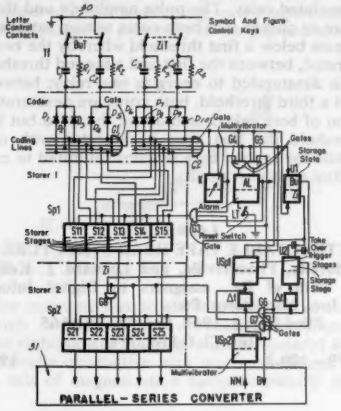
SWITCHING ARRANGEMENT FOR THE AUTOMATIC DELIVERY OF TELEGRAPHIC IDENTIFICATION IMPULSE SEQUENCES

Camillo Bodenstein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 21, 1968, Ser. No. 754,418
Claims priority, application Germany, Sept. 18, 1967, P 15 37 374.7
Int. Cl. H04l *17/02*
U.S. Cl. 178—81 **3 Claims**

A switching arrangement for a teletypewriter system that allows automatic transmission of telegraphic identification

impulse sequences. The invention has an electronic shift register with an electronic transmission circuit in which the individual register stages are connected in parallel to keys associated with switch means.

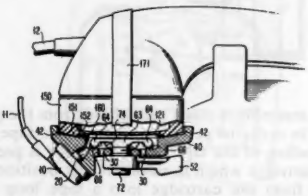


3,619,507

TRANSMIT ONLY ACOUSTIC COUPLER

Philip B. Metz, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,314
Int. Cl. H04m *11/06*
U.S. Cl. 179—1 C **4 Claims**



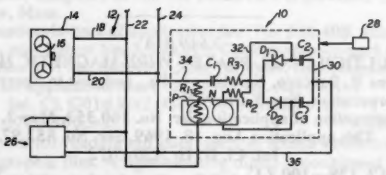
A transmit only acoustic coupler for semipermanent attachment to the microphone cover of a telephone handset, permitting selective transmission of live voice or recorded voice and/or tone encoded data, includes a hearing aid type of dynamic speaker with no back venting, and a valve arrangement adjustable between open and pneumatically sealed positions.

3,619,508

TELEPHONE BURGLAR ALARM

Benjamin Neiger, 20 Saint Pauls Ct., Brooklyn, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,920
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **2 Claims**



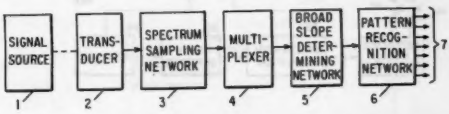
An alarm system which is effective to transmit a call for assistance over the telephone lines of the premises in which, in one improved embodiment, an incoming call which ordinarily is effective to "tie up" the telephone lines and thus render it impossible to send the outgoing message for assistance is eliminated as a shortcoming of the system. Specifically, the current causing ringing of the bell system which is produced by the incoming call is used to illuminate a light source which, in turn, causes the diminishment of the resistance of a photocell in a telephone line shunting circuit, all to the end of restoring the outgoing message interval of service to the system.

3,619,509

BROAD SLOPE DETERMINING NETWORK

James Robert Barger, Haddon Heights, and Phillips Brooks Scott, Haddonfield, both of N.J., assignors to RCA Corporation

Filed July 30, 1969, Ser. No. 845,987
Int. Cl. G10l *1/02*
U.S. Cl. 179—15 A **10 Claims**



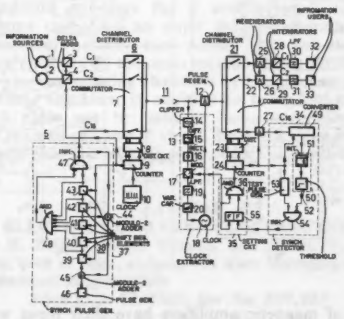
A network which determines whether the slope of a pattern, representing an input signal, is positive going or negative going in selected portions of the pattern. The existence of positive or negative slopes is determined by sampling amplitude components from a sequence of channels representing the pattern and then comparing a plurality of adjacent components with a successive plurality of adjacent components to decide whether the amplitude of the pattern is increasing or decreasing in selected portions of the pattern. Signals, compatible with digital circuitry, are provided to indicate the existence of positive and negative slopes. The invention herein described was made in the course of or under a contract or subcontract thereunder with the department of the Air Force.

3,619,510

TIME DIVISION MULTIPLEX TRANSMISSION SYSTEM FOR THE TRANSMISSION OF SIGNALS BY MEANS OF PULSE CODE MODULATION

Leo Eduard Zegers, and Frank De Jager, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

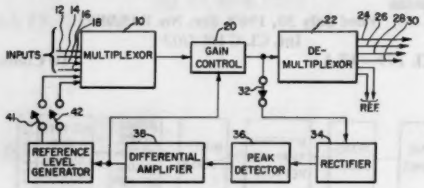
Filed Feb. 19, 1969, Ser. No. 800,644
Claims priority, application Netherlands, Feb. 23, 1968, 6802653
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 AP **22 Claims**



A time multiplex transmission system has a pseudorandom synchronization generator coupled to one of the multiplexer inputs. At the receiver, a synchronization detector is coupled

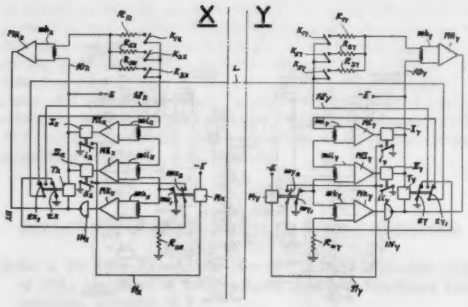
to a demultiplexer output. A pulse is generated if there is no synchronization which causes the demultiplexer to lag behind the multiplexer by one channel per sync cycle until synchronization is achieved.

3,619,511
DATA NORMALIZING APPARATUS
Ken Y. Ishikawa, Bellflower, Calif., assignor to North American Rockwell Corporation
Filed July 17, 1969, Ser. No. 842,502
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 AD **10 Claims**



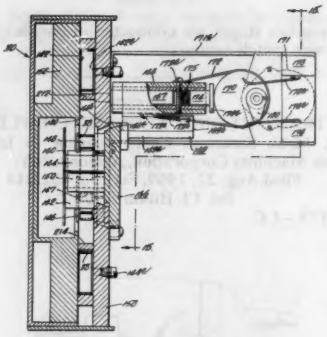
There is disclosed an electronic circuit for operating upon a number of input signals that may be subject to widely varying magnitudes, to provide an optimum magnitude of all of the signals and at the same time retain the relative signal values and an indication of the absolute signal value. A number of input signals are passed through a multiplexor and thence through a gain control amplifier of which the gain is controlled by the maximum signal identified by a peak detector. After normalizing, the signals are fed through a decoder of demultiplexor together with a reference level signal that identifies the absolute value of signals passed through the gain control amplifier. Provision is made for coding the reference level signal to indicate the absolute magnitude of the reference level signal and provision is also made to ensure that the reference level signal does not modify the operation of the peak detector.

3,619,512
DC SIGNALING SYSTEM UTILIZING MAGNETIC AMPLIFIERS
Alberto Ciaccia, and Franco DeMarco, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy
Filed Oct. 6, 1969, Ser. No. 864,144
Claims priority, application Italy, Oct. 4, 1968, 22063 A/68
Int. Cl. H04m *1/26;* **H04q** *9/00*
U.S. Cl. 179—86 **9 Claims**



A pair of magnetic amplifiers have their input windings serially connected to the receiving end of a transmission line for distinguishing between four different levels of direct current transmitted across that line, each amplifier also having an excitation winding energized by a pulse train and a biasing winding normally maintaining the amplifier core in saturation to minimize the magnetic coupling between the excitation winding and an output winding working through a transistor into an associated relay. The pulse amplitude and the winding turns are so chosen that both cores remain saturated with input currents below a first threshold whereby the two relays are unoperated, between the first and a second threshold, the first core is desaturated to energize one relay; between the second and a third threshold, both cores are desaturated with energization of both relays; and above the third but below a fourth threshold the first core is saturated with opposite polarity while the second core remains saturated to maintain only the other relay energized.

3,619,513
RETRACTABLE TAPE HEAD STRUCTURE
Herbert Morello, Phoenixville, and Leonard J. Kelly, Norristown, both of Pa., assignors to Digital Information Devices, Inc., Norristown, Pa.
Filed Dec. 4, 1968, Ser. No. 781,165
Int. Cl. G11b *5/54*
U.S. Cl. 179—100.2 **19 Claims**



A tape head assembly is made retractable from the perpendicularly deck in order to permit passage of the tape during automatic threading of the tape deck. The tape is preferably supplied in a cartridge which is automatically positioned and tape is drawn from the cartridge into a tape loop box in which the head assembly is locate and from which it is withdrawn as tape is drawn into the loop box. The head assembly is replaced after the tape loop is past, whereupon the tape is drawn back into operating position over the tape head assembly. The mounting plate for the tape head assembly in this case is withdrawn perpendicularly from the tape deck, using a king post as a guide. The mounting plate for the head assembly is attached to a slidable support which rides on the king post. The slidable support is moved up by attachment to the slidable support of a flexible band which extends about the periphery of an eccentrically mounted circular cam. The band is made adjustable by including in its length a tension spring. Compression spring means is also provided between the cam and the slidable support, whereby the slidable support is urged downwardly away from the cam. The compression spring is further compressed, however, when the head mounting plate bottoms against an indexing surface of the tape deck urging said plate more firmly against the indexing surface.

3,619,514
MULTICHANNEL PLATED WIRE MAGNETIC HEAD
Eugene B. Barcaro, Norristown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Continuation of application Ser. No. 560,353, May 2, 1966. This application Aug. 18, 1969, Ser. No. 852,973
Int. Cl. G11b *5/20, 5/22*
U.S. Cl. 179—100.2 C **1 Claim**

The present device is a magnetic read-write head which is formed from an electrically conductive wire which is plated

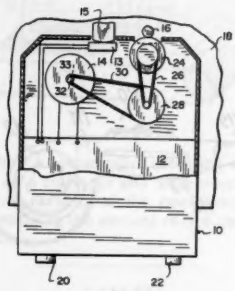
circumferentially with a thin film of magnetizable material and which has a gap formed in the thin film along the length of the wire. The gap serves to provide a break in the flux path in order to effect a recording on a magnetizable recording medium placed in proximity to the gap and also serves as

a path for magnetic flux to effect a read out of information from such a magnetizable recording medium. In the preferred embodiment the magnetizable material is plated to the electrically conductive wire under conditions that form an easy axis of magnetization circumferentially around the wire.

3,619,515
SELF-POWERED ADAPTER CARTRIDGE FOR TAPE PLAYERS

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 3, 1970, Ser. No. 43,046
Int. Cl. G11b *31/00*
U.S. Cl. 179—100.11 **6 Claims**



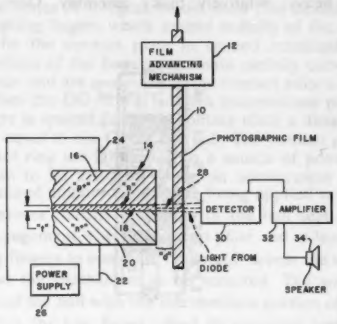
An adapter cartridge of the type having a radio built therein to be inserted into a tape player to convert the same into a radio receiver. The adapter is provided with a generator to rotate under the influence of the capstan drive of the tape player receiving the cartridge and the generator supplies operating power to the radio.

3,619,516
ELECTROLUMINESCENT DIODE SOUND REPRODUCING SYSTEM

Allan S. Miller, Wellesley, and Paul L. Vitkus, Bedford, both of Mass., assignors to Norton Research Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 556,408, June 9, 1966, now Patent No. 3,508,015, Continuation-in-part of application Ser. No. 646,057, June 14, 1967, now abandoned. This application Mar. 13, 1970, Ser. No. 19,412
Int. Cl. G01d *9/42*; G11b *7/12*; H05b *33/16*
U.S. Cl. 179—100.3 Z **4 Claims**

A system for reading out data, such as sound, recorded on a photographic film. A light-emitting diode is positioned with its light-emitting edge less than 0.001 inch from the path of travel of the film. The diode has a transparent region adjacent the PN junction, this transparent region being less than 0.001 inch thick as measured in the direction of film travel and being sandwiched between two opaque layers. A

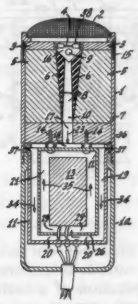


detector is provided on the opposite side of the film to detect the light modulated by the recorded image in the film.

3,619,517
LABYRINTH FOR UNIDIRECTIONAL MICROPHONE

John C. Bleazey, Trenton, N.J., assignor to RCA Corporation

Filed Dec. 23, 1968, Ser. No. 786,265
Int. Cl. H04r *9/08*
U.S. Cl. 179—138 VL **7 Claims**



A labyrinth structure for a unidirectional ribbon-type microphone comprises an outer shell-like member and at least one inner member, each having open and closed ends, the space enclosed by the outer member being divided into at least two communicating chambers by the inner member.

The inner chamber, in addition to being the end of the labyrinth path, can be used to house microphone components therein and also to shield these components by making at least one member of a good electrical conductor.

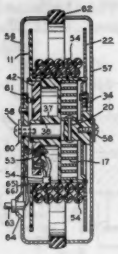
3,619,518
ELECTRIC CORD REEL CONSTRUCTION

Charles H. Blanch, Maple Heights, and James W. Kovacik, Parma, both of Ohio, assignors to Alert Stamping and Mfg., Inc., Bedford Heights, Ohio

Filed Sept. 22, 1969, Ser. No. 859,701
Int. Cl. H02g *11/02*
U.S. Cl. 191—12.2 R **11 Claims**

An improved electric cord reel construction of simplified structure is provided that is lightweight, relatively inexpensive to manufacture and assemble, and requires no lubrica-

tion. Most of the component parts of the reel are molded from plastic and have combined features normally supplied by additional, different parts secured together by various fasteners, thereby avoiding in the present structure the usual overall heavy, relatively bulky assembly. One important



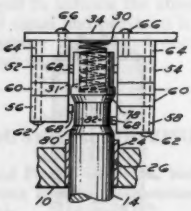
plastic component of the present construction is a plastic hub portion having an integral plastic flange adjacent one end and an internal plastic wall member extending generally radially across the hub portion to divide it into housing chambers on opposite sides of the wall member. The remaining parts are mounted with respect to this component.

3,619,519

MACHINE TOOL SWITCH UNIT ACTUATED BY LONGITUDINALLY AND ANGULARLY MOVABLE HANDLE

Harold E. Wiggins, Clarkston, Mich., assignor to Wells-Index Corporation, Three Rivers, Mich.

Filed Jan. 16, 1970, Ser. No. 3,348
Int. Cl. H01h *25/06, 9/06*
U.S. Cl. 200—4 **5 Claims**



A switch unit for a machine tool having a handle which is manually movable in various directions from a neutral position to control the operation of a cutting tool. Upward and downward vertical displacement and counterclockwise and clockwise rotation of the handle from its neutral position actuates switches controlling electrical and/or hydraulic circuits which move the tool upward and downward vertically and rotate the tool counterclockwise and clockwise respectively. The handle can be rotated from any vertical position, and vertically displaced from any angular position.

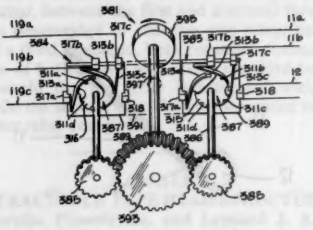
3,619,520

BALLAST CIRCUIT AND SWITCH THEREFOR

Willard R. Garnett, Bellefontaine Neighbors, and Murray L. Quin, Overland, both of Mo., assignors to Emerson Electric Co., St. Louis County, Mo.

Filed Mar. 4, 1969, Ser. No. 804,231
Int. Cl. H01h *9/26*
U.S. Cl. 200—5 F **10 Claims**

A pair of fluorescent lamps operated from a single tow-lamp ballast. The ballast circuit includes a switch for operation of each lamp individually and both together. In some embodiments, the switch has a pair of electrically insulated rotors, one of which makes and breaks an electrical connection to the ballast primary and to the other of which makes and breaks electrical contact between a common lead to one end of each lamp and alternatively a lead to the first lamp and a lead to the second lamp, thereby shorting leads to



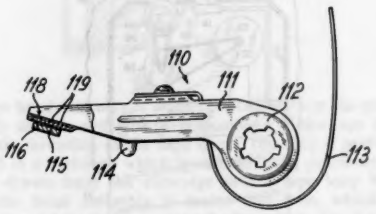
these lamps. The switch thus causes the second lamp and the first lamp respectively to operate singly and together in a predetermined sequence.

3,619,521

IMPROVED CIRCUIT-BREAKING CONTACT ASSEMBLY FOR AUTOMOTIVE DISTRIBUTORS

Oskar Schlossstein, Sonthofen, and Leo Steinke, Hegnach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 11, 1969, Ser. No. 884,199
Claims priority, application Germany, Dec. 13, 1968, G 68 11 233.4, Dec. 13, 1968, G 68 11 235.6
Int. Cl. H01h *19/00*
U.S. Cl. 200—19 R **9 Claims**



A circuit-breaking lever used in conjunction with ignition arrangements in internal combustion engines. The lever is made of stamped and formed sheet metal which is pivoted at one end about a plastic insulated bushing. The free end of the lever carries a contact which is soldered to the sheet metal member. The contact covers a hole through the sheet metal, and the soldered joint forms a ring-shaped portion about the rim of the hole on one side thereof. The area of the lever on which the contact is located, is formed with a plurality of indentations resulting in a checkered pattern. The hole and the indentations weaken the area to prevent stress-influenced damage to the contact and the area of the lever on which the contact is located.

3,619,522

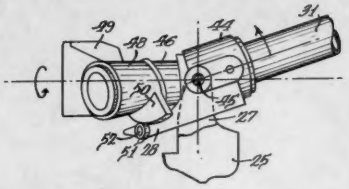
SWITCH CONSTRUCTION

Roy T. Swanson, North Riverside, Ill., assignor to H. K. Porter Company, Inc., Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,408
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **12 Claims**

Disconnecting switch means for high-tension electrical power installations having a switch blade pivoted for movement by crank means about an arc and rotatable about its own axis into and out of pressure engagement with a fixed remotely spaced contact, and characterized by cam means

for increasing the load-lifting ability when the switch is opened and the arm extends horizontally to transfer torque



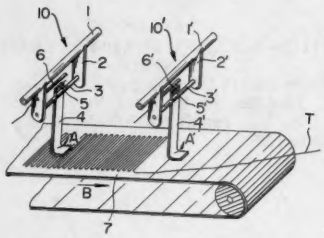
from the crank means to the switch blade to provide increased load-lifting ability.

3,619,523

APPARATUS FOR AUTOMATIC CONTROL OF TOW TAKEUP MEANS BY DETECTING THE AMOUNT OF TOW ON CONVEYOR

Tatsumi Tanabe, Ehime-ken, Japan, assignor to Teijin Limited, Osaka, Japan

Filed July 15, 1969, Ser. No. 841,813
Claims priority, application Japan, July 23, 1968, 43/51967
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **6 Claims**



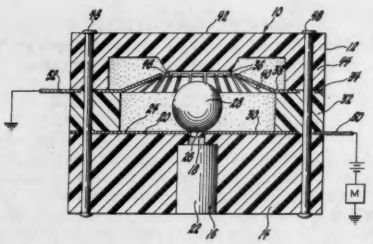
Apparatus for automatically detecting changes in the amount of tow on a conveyor and thereby automatically controlling the start or stop of the operation of tow takeup means and maintaining the amount of tow on the conveyor at a specified value.

3,619,524

SENSOR

Arden G. Gillund, Oak Creek, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed May 8, 1970, Ser. No. 35,674
Int. Cl. H01h *35/02*
U.S. Cl. 200—61.45 **4 Claims**



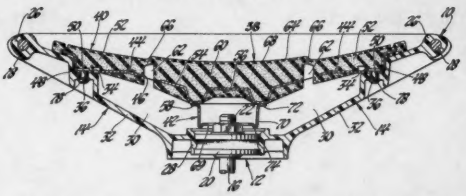
A sensor includes a cylindrical housing having an apertured planar base wall and contact plate. An axial pole magnet is mounted on the base wall and located normal to the aperture. The magnetic flux of the magnet maintains a ball in seated relationship within a ball seat provided by the embossed opening of the apertured plate. The OD of the ball is greater than that of the magnet. A contact ring is mounted on a circular sidewall of the housing and includes a peripheral series of integral cantilevered thin flexible axially tapered spring fingers which extend radially of the ball seat and overlie the contact plate in spaced relationship. The distal portions of the fingers terminate radially outwardly of the ball seat and are spaced from the contact plate a distance greater than the OD of the ball. An intermediate portion of each finger is spaced from the contact plate a distance substantially equal to the OD of the ball. The contact plate and the contact ring are connected to a source of power and a mechanism to be actuated. Upon an acceleration pulse of predetermined amplitude and time being applied to the ball, the ball moves radially outwardly of the ball seat and into wiping engagement with the contact plate and at least one of the spring fingers to complete the circuit across the source of power and the mechanism to be actuated. The wiping engagement of the ball with the intermediate portion of the one finger flexes the one finger about its proximal portion and creates a spring biasing force returning the ball toward the ball seat when the acceleration pulse is reduced. A cover for the housing seats on the sidewall and includes a stop projecting transverse of the distal portion of the fingers and overlying the ball seat to limit movement of the ball axially of the seat.

3,619,525

STEERING WHEEL CUSHION INSTALLATION

Roy H. Sjoberg, Jr., Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1970, Ser. No. 67,745
Int. Cl. H01h *9/00*
U.S. Cl. 200—61.55 **3 Claims**



An improved vehicle steering wheel cushion installation, the installation including a cushion assembly having separated resilient inner and outer pads covered by a relatively solid skin which forms a self-biased hinge connecting the inner pad to the outer pad for reciprocating movement relative thereto. The outer pad of the cushion assembly is secured to the steering wheel generally over the spokes thereof and the self-biased hinge normally maintains the inner pad in a retracted position wherein a first switch terminal on the inner pad is spaced from a second switch terminal on the steering wheel. Pressure on the cushion assembly over the inner pad initiates movement of the latter against the hinge bias to an extended position wherein the two switch terminals make contact to complete the vehicle horn circuit.

3,619,526

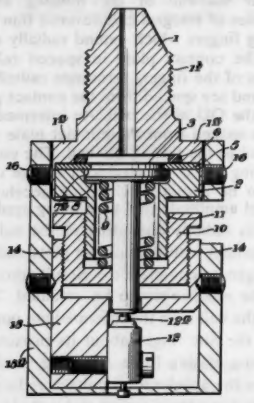
PRESSURE-ACTUATED SWITCHES

Terence Alexander Riley, Farnham, England, assignor to Simplifix Couplings Limited, Maidenhead, Berkshire, England

Filed July 23, 1969, Ser. No. 843,997
Claims priority, application Great Britain, Aug. 19, 1968, 39,622/68
Int. Cl. H01h *35/38*
U.S. Cl. 200—83 J **1 Claim**

A pressure-operated electric switch, consisting of a housing having a spring loaded piston therein and a diaphragm

moved by pressure change, with a microswitch having its operating pin coaxial with the piston and axially adjustable in

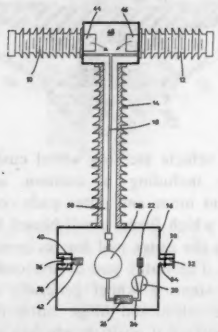


relation to the piston, with the loading of the spring on the piston also adjustable independently of the pin to the piston.

3,619,527
COMPRESSED-AIR ELECTRIC APPARATUS EMBODYING A DRYING DEVICE

Gerald Billion, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Oct. 16, 1969, Ser. No. 867,012
Claims priority, application France, Nov. 6, 1968, 172,839
Int. Cl. H01h *33/57*
U.S. Cl. 200—148 E **4 Claims**



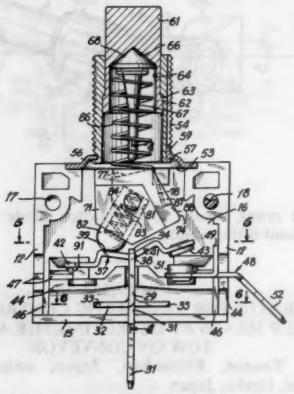
Compressed-air electric apparatus such as a circuit interrupter having a compressor to compress air taken from a low-pressure vessel. The pressure in said vessel is close to the atmospheric pressure and an inlet valve controls the admission of atmospheric air to said vessel as the pressure therein drops below a predetermined value upon functioning of the compressor in case of leakage of high-pressure air. A drying device dries the air supplied by the compressor. The result is a substantially closed-circuit air circulation relieving the drying device without needing an absolutely hermetic sealing.

3,619,528
MOMENTARY PLUNGER SWITCH

Richard W. Sorenson, West Hartford, Conn., assignor to Carling Electric Inc., West Hartford, Conn.

Filed Aug. 14, 1970, Ser. No. 63,715
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 J **6 Claims**

A momentary plunger-type electric switch in which a single plunger return spring performs the simultaneous additional function of returning the switch lever to its initial position. The switch case is made of a pair of identical juxtaposed half-shells which accommodate a unitary contact terminal in

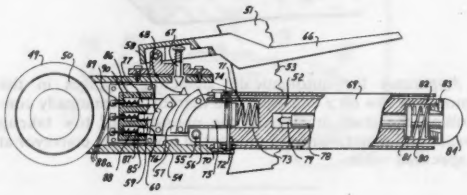


either of two positions according as a normally open or a normally closed switch is specified or desired. The device can be utilized as a single-circuit or a two-circuit switch.

3,619,529
THROTTLE MECHANISM FOR USE IN TRAIN SLACK CONTROL

Raymond N. Nealis, 16 Deepdale Drive, Levittown, Pa.

Filed Nov. 17, 1969, Ser. No. 877,105
Int. Cl. H01h *9/06*
U.S. Cl. 200—157 **3 Claims**



A manually operated locomotive power control throttle constructed in two parts. The engineer can move one part relative to the other for controlling slack between the cars and can move the two parts in unison for controlling the speed of the locomotive with or without effecting the slack.

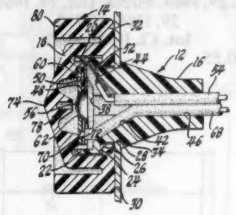
3,619,530
DOORJAMB SWITCH

Patsy De Vincent, and Sidney G. Dunford, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1970, Ser. No. 33,310
Int. Cl. H01h *13/48, 13/06, 13/52*
U.S. Cl. 200—159 B **4 Claims**

A doorjamb switch includes an annular housing comprised of an annular support portion and an annular flexible portion. Interlocking flanges on the portions cooperate to secure the portions to each other and assemble the housing. In one embodiment, the support portion includes an annular contact receptacle which receives a generally planar first contact and a disklike second contact separated by an insulating washer. Upon assembly of the housing, an annular mounting surface of the flexible portion engages the periphery of the first contact and seats the periphery of the second contact of an annular mounting surface of the support portion. The first contact is fixed with respect to the support portion and the periphery of the second contact is slidable between the insu-

lating washer and the surface of the support portion. As mounted, the second contact is concave and has a central projection received within central apertures of the insulating washer and the first contact. The concavity of the second contact biases the central projection into engagement with the first contact to close the switch. A central portion of the flexible portion is engageable by a door during closing movement to flex the central portion and cause it to abut the central projection of the second contact. This increases the concavity of the second contact and moves it out of engagement



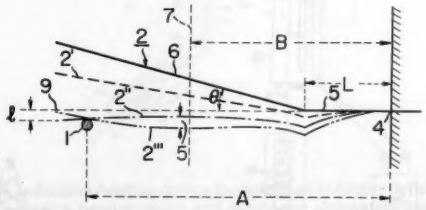
with the first contact to open the switch. The periphery of the second contact slides between the washer and the surface of the support portion when the concavity of the second contact is increased. An outer protective flange on the flexible portion prevents excessive flexing of the flexible portion and possible damage to the contacts. In another embodiment, a housing includes a flexible portion that acts on peripheral portions of a concave disklike contact to decrease the concavity thereof and move the disklike contact out of engagement with a fixed contact.

3,619,531

CONTACT ASSEMBLY FOR AN ELECTRONIC MUSICAL INSTRUMENT

Shin-ichi Murakami, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuaka-ken, Japan

Filed Jan. 19, 1970, Ser. No. 3,905
Claims priority, application Japan, Jan. 21, 1969, 44/3835
Int. Cl. H01h *1/18*
U.S. Cl. 200—166 J **2 Claims**



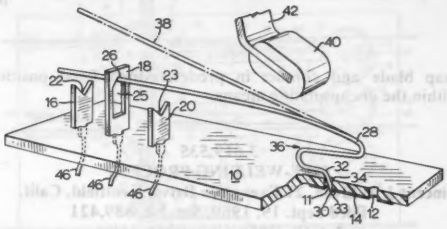
An improved contact assembly for an electronic musical instrument in which the distance between a fixed element and the fixed end of a movable element, the distance between an actuator and the fixed end of the movable element, the stroke length of the actuator between the position of first contact of the movable element with the fixed element and the most depressed position of the actuator, the length of a horizontal portion of the movable element, the angle of an inclined portion of the movable element with respect to a horizontal base line, and the distance between the fixed element and the horizontal base line are such that the ratio of the amount of slide of the movable contact element on the fixed contact element in a push direction to that in a pull direction during operation of the contact assembly is from about 1:1 to about 1:2.

3,619,532

SELF-ALIGNING CONTACT FOR SWITCH

Fritz L. Lyvang, Wallenstein, Ontario, Canada, assignor to Electrohome Limited, Ontario, Canada

Filed Sept. 17, 1969, Ser. No. 858,742
Int. Cl. H01h *1/00*
U.S. Cl. 200—166 J **6 Claims**



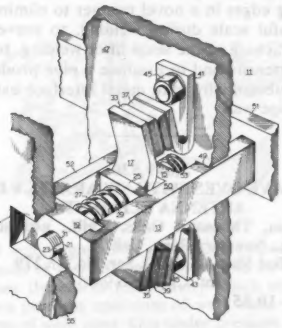
A resilient elongated wirelike contact which is self-aligning in an aperture in a base member. The aperture is circular and has a greater diameter than the wirelike contact, so that an end portion of the latter can be inserted in the aperture, oriented in a desired direction so as to make the end portion bind angularly in the aperture, and then fixed to the base member as by soldering.

3,619,533

CONTACTOR WITH TIP WEAR INDICATOR

George L. McFarland, Salem, Va., assignor to General Electric Company

Filed May 15, 1970, Ser. No. 37,581
Int. Cl. H01h *9/16*
U.S. Cl. 200—167 R **4 Claims**



A contactor, with a contact tip wear indicator for visually denoting the status of contact tips, includes a calibrated member coacting with a movable contact assembly to project externally from the contactor a distance proportional to the distance traveled by the movable contact to engage stationary contacts.

3,619,534

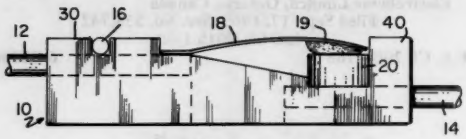
SNAP ACTION CIRCUIT BREAKER

Richard E. Perkins, South Windham, Maine, assignor to Sylvania Electric Products Inc.

Filed Jan. 2, 1970, Ser. No. 281
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G **1 Claim**

A snap action circuit breaker having encapsulating means such as a casing and a support secured within the encapsulat-

ing means. The support is designed to accommodate the components of circuit breakers such as the lead-in wires,

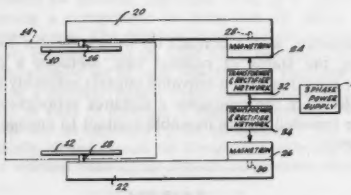


snap blade and contact in predetermined fixed positions within the encapsulating means.

3,619,535
PIPE-WELDING PROCESS
Vincent J. Sullivan, 21 Evergreen Drive, Kentfield, Calif.
Filed Sept. 19, 1969, Ser. No. 859,421
Int. Cl. H05b *5/00*; **B23k** *31/06*
U.S. Cl. 219—8.5 **9 Claims**

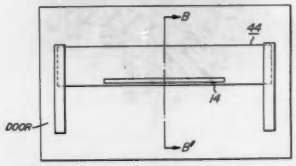
This is an improved process of induction welding of steel pipe and an improved product of such process. After steel skelp is formed into a tubular blank with an open longitudinally extending seam, the seam edges are continually heated, converged and pressure-welded. Heat is applied to the converging edges in a novel manner to eliminate entrapment of harmful scale during welding, to prevent thermal stressing or cracking of the seam after welding, to arrest the growth of martensite and to produce a pipe product characterized by a substantially pure metal interface extending the width of the pipe wall.

3,619,536
MICROWAVE OVEN WITH SEPARATELY DRIVEN ANTENNA ELEMENTS
Helmut Boehm, Thousand Oaks, Calif., assignor to Bowmar/Tic Inc., Newbury Park, Calif.
Filed May 14, 1970, Ser. No. 37,279
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **10 Claims**



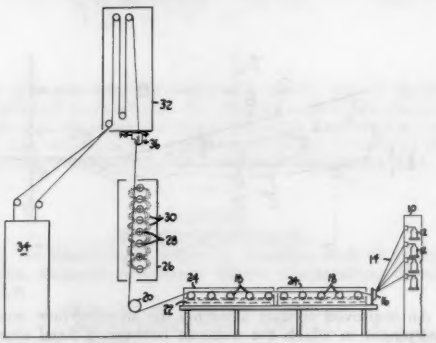
There is disclosed a respective magnetron and waveguide feed for antenna elements that are adjacent and parallel to opposed walls in an oven cavity. In one embodiment, a pair of antennas have their magnetrons simultaneously operated from a three-phase power supply. Another embodiment illustrates a plurality of opposed pairs of antenna elements with respective magnetron and waveguide feeds, and switching means connected between a power supply source and each of the magnetrons for selectively multiplexing their operations in pairs.

3,619,537
HIGH-FREQUENCY HEATING DEVICE
Tomoyuki Hosokawa, Nara; Hazime Mori, Toyonaka, and Shigeru Kusunoki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 12, 1970, Ser. No. 79,919
Claims priority, application Japan, Oct. 18, 1969, 44/83415, Nov. 20, 1969, 44/110738, Dec. 8, 1969, 44/98798, Dec. 8, 1969, 44/98799, Dec. 29, 1969, 45/288, Dec. 29, 1969, 45/682, Dec. 29, 1969, 45/750
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **7 Claims**



A high-frequency heating device in which an electromagnetic contactor for controlling a high-voltage circuit of a high-frequency wave oscillator is provided with a touch switch circuit which is energized by detecting an electric variation caused when brought into contact with a human body, and said electromagnetic contactor is controlled when a human body touches and leaves contact electrodes provided in said touch switch circuit.

3,619,538
PROCESS AND APPARATUS FOR HIGH-FREQUENCY ELECTRICAL DRYING OF FIBROUS STRAND
John Kallenborn, Murrysville, and George B. Zurheide, Upper St. Clair, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Mar. 3, 1970, Ser. No. 16,070
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.61 **9 Claims**

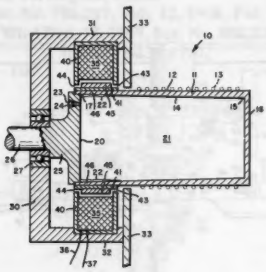


A process and apparatus for drying a liquid adhesive composition on a fibrous substrate. The apparatus comprises a dielectric heater having a grid of spaced, parallel electrodes with a high-frequency electrical field extending therebetween, means for conveying the fibrous substrate through the electrical field in a plane spaced from the plane of the electrodes and means to adjustably position the plane of the substrate and the plane of the electrodes at an angle relative to each other and to dampen vibration of the substrate in a direction perpendicular to the direction of its path of travel.

3,619,539
FLUID HEATED ROLL

Daniel G. Taylor, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 22, 1970, Ser. No. 39,834
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 219—10.61 **8 Claims**

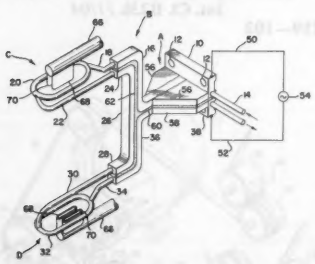


A roll for continuously heating an article of indefinite length such as a textile filament or fiber is disclosed. A source of heating is localized at a fluid filled chamber so the fluid can be boiled off and condensed on a tapered surface that is in heat exchange relationship with the exterior working surface of the roller means. The interior tapered surface acts to return the condensed fluid under the centrifugal action caused by the rotating roll means. This closed cycle fluid heating arrangement provides for uniform application of heat as it is removed from the surface of the heated roll, either by windage losses or by transfer to the moving article that is being heat treated.

3,619,540
HEATING ZONE DUAL INDUCTOR

David Robert Soworowski, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Aug. 10, 1970, Ser. No. 62,578
Int. Cl. H05b *5/00, 9/06*
U.S. Cl. 219—10.71 **8 Claims**



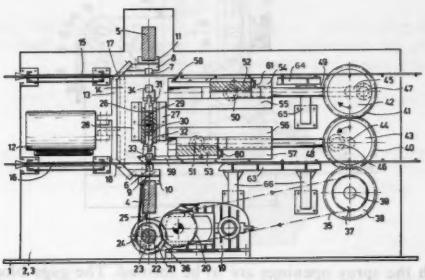
An induction heating device including an inductor defining two separate heating zones and means for alternately inserting a workpiece into each of these heating zones.

3,619,541
APPARATUS FOR THE WELDING OF GRID STRUCTURES COMPOSED OF INTERSECTING LONGITUDINAL AND TRANSVERSE RODS

Heinz Webers, Osterath, Germany, assignor to Bau-Stahlgewebe GmbH, Dusseldorf-Oberkassel, Germany

Filed Apr. 10, 1970, Ser. No. 27,335
Claims priority, application Germany, Apr. 12, 1969, P 19 18 601.7
Int. Cl. B23k *11/00*
U.S. Cl. 219—56 **4 Claims**

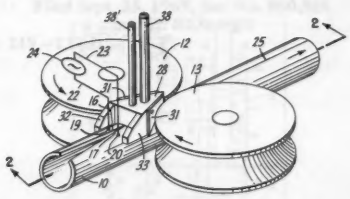
Apparatus for spot welding the intersection points of grids composed of sets of parallel longitudinal and transverse rods comprises double action vertically reciprocable, movable, welding beam carrying aligned upper and lower welding electrodes spaced by distances equal to the spacing distance of the longitudinal rods and a pair of upper and lower stationary welding beams carrying cooperating electrodes aligned with the electrodes of the movable beam, for the welding of a pair of grids fed in different horizontal planes in the direction of the longitudinal rods between each pair of cooperating stationary and movable welding electrodes. The grids are fed intermittently at the rhythm of the welding operations from one to the next welding position by distances equal to the spacing distance of the transverse rods, the arrangement being such as to feed one grid during the welding of the other grid, and vice versa, by means of a pair of gripping and feeding devices operated in phase opposition in the direction parallel to the longitudinal rods.



3,619,542
METHOD AND APPARATUS FOR WELDING IN CONTROLLED ATMOSPHERE

Edgar D. Oppenheimer, Mamaroneck, N.Y., assignor to AMF Incorporated

Filed Dec. 23, 1969, Ser. No. 887,716
Int. Cl. B23k *31/06*
U.S. Cl. 219—67 **17 Claims**



First and second gas shoes are placed respectively, on opposite surfaces of two adjacent portions to be welded. Shoes have recesses therein to form cavity which includes spaced edges of two portions upstream of weld zone. Tips of shoes are upstream of weld zone. Gas under pressure is admitted to cavity to bathe edges in controlled atmosphere and gas in a jet escapes at tips of shoes and is directed into weld zone to envelop weld zone in controlled atmosphere.

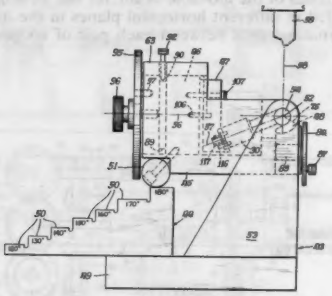
3,619,543
POSITIONING FIXTURE TO FACILITATE NOZZLE DRILLING BY EDM

Edward A. Slindee, Elmhurst, and Geroge E. Nicoletti, Berwyn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 18, 1970, Ser. No. 12,218
Int. Cl. B23b *1/12, 47/28*
U.S. Cl. 219—69 R **10 Claims**

Fixture assembly for holding a nozzle blank on which spray openings are to be formed by electric-discharge machining. The fixture assembly comprises a base, a gage block, a pivot block, an adapter block, an adapter, and a headblock. The nozzle blank is held between the adapter and a conical recess in the headblock. The headblock is adjustably positioned so

as to accommodate nozzle blanks of different sizes. The adapter is selected so as to give the desired angle between the nozzle blank axis and the axis of the imaginary cone on



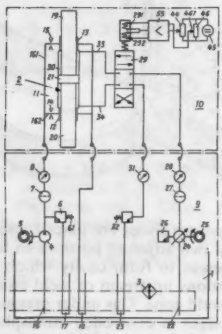
which the spray openings are to be formed. The gage block determines the angle at which the pivot block is held and thus the angle of the cone of the spray openings.

3,619,544

ELECTROEROSION MACHINE WITH SEPARATELY CONTROLLED ELECTRODE FEED MEANS AND FLUID BEARING FILM FOR ELECTRODE SUPPORT MEANS

Werner Ullmann, Locarno; Rudolf Ineichen, Effretikon, and Fritz Lutolf, Losone, all of Switzerland, assignors to A.G. Fur Industrielle Elektronik Agie Losone B. Locarna, Losone-Locarno, Switzerland

Division of Ser. No. 574,028, Aug. 22, 1966, Pat. No. 3,521,021. Filed Nov. 19, 1969, Ser. No. 878,028
Claims priority, application Switzerland, Aug. 20, 1965, 11753/65
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 G **4 Claims**



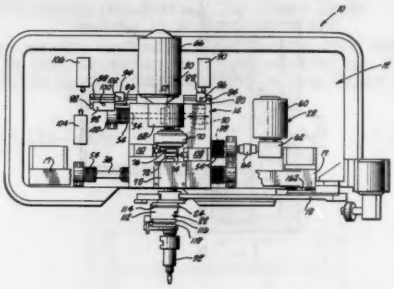
An electroerosion machine including a cylinder means, piston means with the cylinder means. The piston embodies oppositely directed projecting rod portions, one of which constitutes an electrode support controllable means serve to establish a fluid film-bearing surface at axially spaced locations of the rod portions. There are also provided separate and independently controllable means for supplying and exhausting pressure fluid to and from the cylinder means on opposite sides of the piston including electromagnetically operated valve means. A control circuit is provided for the valve means operable to actuate said valve means to impart axial movement to the piston means and thus the electrode support to effect any one of a manually controlled electrode feed movement, an automatically regulated constant feed movement, and a feed movement including imparting vibratory movement to the electrode.

3,619,545

HARD FACING MACHINE

Rolland Ernest Borden, Inglewood, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Mar. 12, 1969, Ser. No. 806,433
Int. Cl. B23k *9/04*
U.S. Cl. 219—77 **12 Claims**



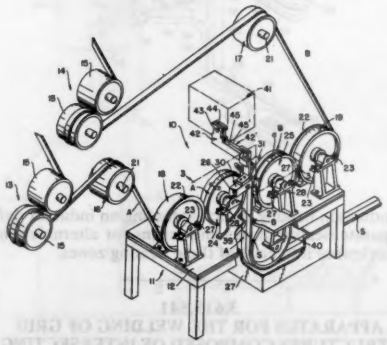
Hard facing is applied to the end of a workpiece in the form of a chain saw blade by a heliarc torch while the blade is traversed twice and rotated between traverses. The traverses are produced by a table which is moved on a base. Rotation is effected by a motor mounted on the table. A control circuit determines the initiation and termination of the traverses and rotation at predetermined points in the hard face application cycle and during a return cycle. Weld wire is positively advanced into the welding zone by a weld wire feed assembly. A clamp holds the workpiece blade during the hard facing application. The torch, being carried with the weld wire feed assembly, is maintained in proper relationship to the workpiece by a cam which moves in index with the workpiece.

3,619,546

LONGITUDINAL STRIP EDGE BUTT WELDING

Sidney Briggs, III, Bay City, Mich., assignor to Amtel Inc., Providence, R.I.

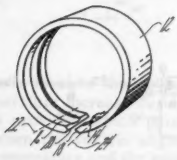
Filed May 12, 1969, Ser. No. 823,716
Int. Cl. B23k *11/04*
U.S. Cl. 219—102 **25 Claims**



A pair of wide, elongated strips to be butt welded together pass convergently into a weld zone, as partially wrapped about large diameter rubber covered rolls, thus placing the converging strips in an arcuate cross section in reaching the apex of the weld zone, rather than approaching it in convergent flat planes. Transverse deflection of the strips normal to their planes, tending to cause their edges to snap past one another to an excessive overlap, is eliminated. The strips are heated to welding temperature by either sliding contact elec-

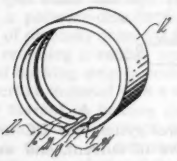
trodes or inductive heating means. Each strip edge laterally overhangs slightly an edge of its large diameter wrapping roll.

3,619,547
PREHEATING AND WELDING METHOD FOR BEARING RACES AND OTHER ARTICLES
Erman V. Cavagnero, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.
Division of Ser. No. 706,217, Feb. 12, 1968, Pat. No. 3,522,644.
Filed Dec. 18, 1969, Ser. No. 886,208
Int. Cl. B23k *11/02*
U.S. Cl. 219—104 7 Claims



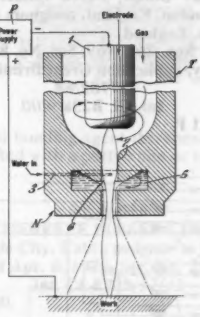
A fusion welding method for steel exceeding 0.4 percent carbon content where all such steel in the article which is integral with the weld surfaces is heated above the upper transformation temperature resulting in a superior weld and a sound article absent localized areas of martensite and other detrimental characteristics. Preheating, simultaneous heating, and/or post heating is employed and when an article is preheated, surfaces to be welded are maintained relatively cold to minimize oxidation.

3,619,548
PREHEATING AND WELDING METHOD
Erman V. Cavagnero, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.
Division of Ser. No. 706,217, Feb. 12, 1968, Pat. No. 3,522,644.
Filed Dec. 18, 1969, Ser. No. 886,082
Int. Cl. B23k *11/02*
U.S. Cl. 219—105 28 Claims



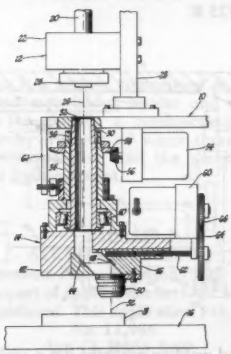
A fusion welding method for steel exceeding 0.4 percent carbon content where all such steel in the article which is integral with the weld surfaces is heated above the upper transformation temperature resulting in a superior weld and a sound article absent localized areas of martensite and other detrimental characteristics. Preheating, simultaneous heating, and/or post heating is employed and when an article is preheated, surfaces to be welded are maintained relatively cold to minimize oxidation. Surfaces to be welded are freshly exposed immediately prior to welding and in an extremely rapid sequence of operations and when preheating is employed; surface exposure, preheating and welding steps are carried out in rapid sequence to minimize oxidation. Surfaces are provided with V-shaped configurations novel to resistance upset butt welding.

3,619,549
ARC TORCH CUTTING PROCESS
John A. Hogan, Somerset, and Robert M. Gage, Summit, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.
Filed June 19, 1970, Ser. No. 47,840
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P 6 Claims



High quality, square cuts are obtained in metals by an arc process wherein an arc is struck between an electrode and workpiece, a gas vortex is passed around the electrode and is directed into a constricting nozzle passage where a liquid, usually water, vortex swirling in the same direction as the gas vortex is introduced. The arc passes through the gas and liquid vortex and through the nozzle and is directed in a highly constricted state against the workpiece to be cut.

3,619,550
LASER BEAM MACHINE TOOL WITH BEAM MANIPULATING APPARATUS
David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.
Filed Sept. 25, 1969, Ser. No. 860,986
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 L 7 Claims



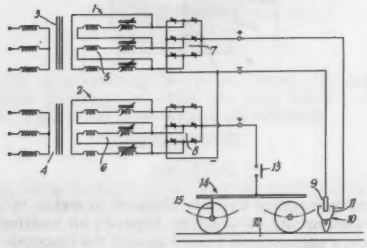
A machine tool using a laser cutting beam is disclosed. The machine tool includes apparatus for directing the laser beam onto a workpiece at a desired location and for generating a predetermined pattern. A rotatable toolhead is provided with a beam passage along its axis of rotation and beam deflecting and beam forming means rotatable with the toolhead are operative to direct the beam onto the workpiece. The beam may be axially and radially offset as desired by reflectors movable with the toolhead so that the beam is manipulated in a highly efficient manner. The apparatus is capable of machining a workpiece surface with the cutting beam

directed perpendicularly thereto at any desired radius ranging from zero upwards. It is also capable of machining a workpiece surface inclined at any angle with reference to the axis of toolhead rotation. The apparatus is especially adapted for use in automatically controlled machine tools for programmed movement of the cutting beam.

3,619,551
CLEANING OF RAILS

David John Miller Dobbs; Derek Linder, and Leslie John Giles, all of London, England, assignors to British Railways Board, London, England

Filed Nov. 26, 1969, Ser. No. 880,197
Claims priority, application Great Britain, Dec. 5, 1968, 57782/68
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P **5 Claims**

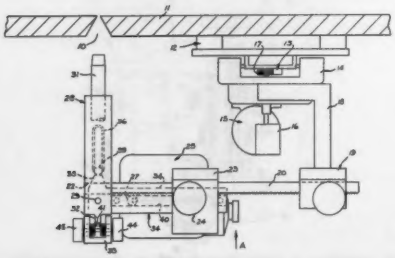


A method of cleaning a rail comprises subjecting the head of the rail to the gas jet from a plasma-arc torch operated in the nontransferred mode, but with an additional current passed between the torch and the head of the rail.

3,619,552
OSCILLATING WELDING ELECTRODE WITH DWELL CONTROL

Richard Allan Gordon Cape, Lachine, Quebec, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada

Filed Sept. 30, 1969, Ser. No. 862,292
Claims priority, application Canada, Sept. 5, 1969, 061,318
Int. Cl. B23k 9/12
U.S. Cl. 219—125 R **18 Claims**

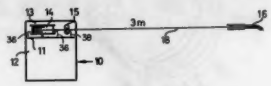


An automated welding machine has a welding gun support and first drive means for moving the support in a longitudinal direction, second drive means to produce an oscillatory motion of the support transverse to the longitudinal direction, so that the combined effects of the drive means causes the support to trace out a weaving path. The oscillatory motion of the support, and hence the weave amplitude of the path traced by the support is controlled by adjustable abutment means which cooperate with the support. A resiliently yieldable torque-transmitting element couples the support to the oscillatory driving means to provide lost motion between this driving means and the support when the latter engages the adjustable abutment means. The adjustable abutment means can thus be adjusted to vary the weave amplitude of the support, and is selectively adjustable to alter the dwell period of the support at either or each extremity of its oscillatory motion.

3,619,553
REMOTELY DISPOSABLE ADVANCE AND SUPPLY UNITS FOR ARC WELDING

Gunter Wilkens, Kelkheim/Taunus, and Werner Becker, Frankfurt/Main, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Apr. 17, 1969, Ser. No. 816,948
Claims priority, application Germany, Apr. 20, 1968, P 17 65 224.3
Int. Cl. B23k 9/00
U.S. Cl. 219—130 **10 Claims**

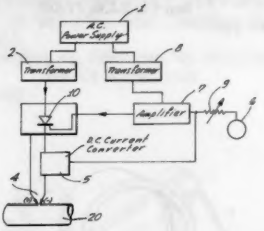


An electric arc welding device utilizes a current source housing, a wire storage device and a wire advance device. The wire storage and advance devices are mounted in such a manner that they can be either within or outside the current source housing.

3,619,554
DC ARC WELDING CURRENT CONTROL RESPONSIVE TO CURRENT AND WORKPIECE FEED RATE

Wolfram Klebl, Isernhagen, and Heinrich Schrieber, Leeste Ueber Bremen, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Jan. 20, 1970, Ser. No. 004,355
Int. Cl. B23k 9/10
U.S. Cl. 219—131 WR **1 Claim**



A feedback control system for DC arc welding wherein signals representative of current, and workpiece feed rate, are combined to control the current supplied through a thyristor rectifier, from a leakage reactance transformer providing a smoothed AC output current, to provide fast response current control.

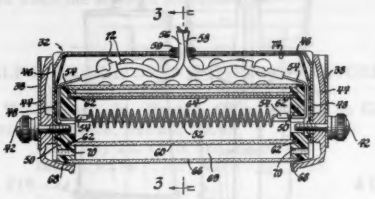
3,619,555
INFRARED CAR HEATER

Arthur T. Bassett, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1970, Ser. No. 5,057
Int. Cl. B60l 1/02; H05b 3/02
U.S. Cl. 219—202 **1 Claim**

An infrared heater for warming the passenger compartment of an automobile is adapted to be adjustably supported from the underside of the dashboard. The heater includes an elongated resistance heating element which is encircled by an inner filter tube which is transparent to infrared radiation from the heating element, but which blocks visible light from passing into the passenger compartment. A semicircular reflector within the filter tube directs radiation from the ele-

ment into the compartment. An outer, larger diameter, protective tube encircles the filter tube in spaced relation thereto. The protective tube is also transparent to infrared radiation from the element but may or may not filter visible light as does the inner tube. The space between the tubes is



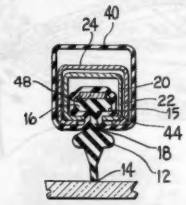
vented to thermally insulate the outer tube and to prevent undesirable temperature increase during heater operation. A control circuit is provided which permits the heater to be energized only when the vehicle engine coolant is below a predetermined temperature and the ignitions switch is on.

3,619,556

ELECTRICALLY HEATED WEATHERPROOF WIPER BLADE

Raymond A. Deibel, West Falls, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,266
Int. Cl. B60l *1/02*
U.S. Cl. 219—203 **2 Claims**



A windshield wiper blade and arm assembly in which the blade comprises a pressure-distributing superstructure including a number of pivotally connected levers and a flexible backing strip for retaining a rubber squeegee element. The superstructure and backing strip is enclosed by an envelope of rubber or rubberlike material with a squeegee element extending exteriorly thereof. A heating element is disposed in heat exchange relationship with respect to the envelope and is connected to a source of electrical energy through a detachable connection exteriorly of the rubber element. An electrical conductor extends from the above-mentioned connection along the length of the wiper arm to a connecting terminal on the cowl of a motor vehicle.

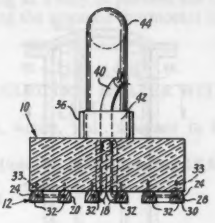
3,619,557

DEVICE FOR FACILITATING REMOVAL OF ASPHALT TILE

Lawrence D. McClure, 1321 Louis Drive, Antioch, Calif.

Filed Apr. 25, 1969, Ser. No. 819,342
Int. Cl. H05b *1/00*
U.S. Cl. 219—228 **1 Claim**

An elongated, generally rectangular thermally and electrically insulative body is provided at the top with a handle. At least one elongated sheathed electric heating element is fixed against the flat bottom surface of the body. The heating element includes a plurality of parallel looped portions having flat, coplanar, bottom extremities in spaced relation across the width of the bottom. The heating element is coextensive with at least three edges of the bottom of the body. The heating element is regulated by a heat control on the body. In use, the device is moved over the surface of asphalt tiles to



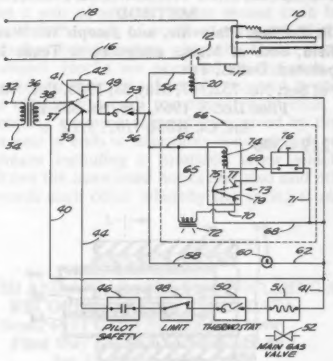
heat the tiles and bonding agent therebeneath. The softened tiles are easily lifted with a putty knife or similar tool.

3,619,558

ANTIFREEZE BOILER CIRCUIT

Leo Block, Temple City, Calif., assignor to Raypak Inc.

Filed Apr. 6, 1970, Ser. No. 25,646
Int. Cl. F22b *37/42*
U.S. Cl. 219—280 **4 Claims**



The invention is a system comprising an electric heating element installed in a boiler header and control circuitry therefor so as to protect a nonfunctioning boiler from damage caused by freezing of water therein if the boiler pump becomes inoperative and the ambient temperature drops below the freezing point.

3,619,559

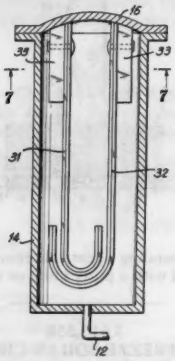
STEAM GENERATOR

Nat Camp, Homestead Place, Harrison, N.Y.

Continuation-in-part of application Ser. No. 826,870, May 22, 1969, now abandoned. This application Feb. 17, 1970, Ser. No. 11,986
Int. Cl. H05b *3/60*
U.S. Cl. 219—288 **5 Claims**

A steam generator has a boiling chamber receiving water from a reservoir through a capillary tube and discharging steam through an outlet having a selectively variable orifice size. A pair of spaced electrodes in the form of metal strips are suspended within the chamber and are connected across a voltage source. The lower portion of each metal strip has conductive portion of larger area than the upper portion thereof. The enlarged area extends from the vicinity of the chamber bottom to about the middle third of the chamber. The electrodes can be formed by a pair of flat metal strips disposed in parallel vertical planes and each having an enlarged portion of either constant or variable width. Alterna-

tively, each electrode can be formed from a strip bent in its dimension of thickness to form a "J" configuration. The pair

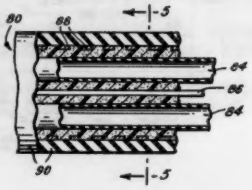


of J-shaped electrodes are vertically supported in nested relationship in either identical or inverted orientation.

3,619,560
SELF-REGULATING THERMAL APPARATUS AND METHOD

Francis P. Buiting, Plainville, and Joseph W. Waseleski, Jr., Mansfield, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 732,717, May 28, 1968, Pat. No. 3,501,619.
Filed Dec. 5, 1969, Ser. No. 888,189
Int. Cl. H05b *1/02, 3/12*
U.S. Cl. 219—300 **8 Claims**



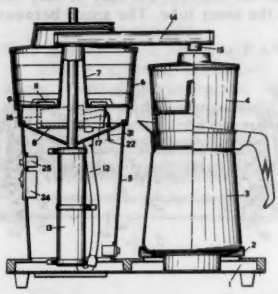
Electrical heating devices and methods of making same employing polymeric materials which display a steep-sloped positive temperature resistivity coefficient (PTC) which serves to self-regulate the amount of heat produced. The materials are ductile and can be molded, extruded, machined and formed in complex shapes including the following embodiments: A utensil formed of a PTC heater element defining a cavity therein; the heating element encapsulated in an electrical insulating jacket preferably formed of material having the same thermal coefficient of expansion and also serving as thermal insulation where desired. Another embodiment employs a plurality of PTC elements having different anomaly temperatures to provide a choice in temperature selection. Yet another embodiment shows either open or closed ended passages formed in a PTC heating element.

3,619,561
COFFEE-MAKING APPARATUS

Gerard Clement Smit, Utrechtse Straatweg 26, Amerongen, Netherlands

Filed May 9, 1969, Ser. No. 823,443
Claims priority, application Netherlands, June 20, 1968, 6,808,675
Int. Cl. F24h *1/08*
U.S. Cl. 219—333 **1 Claim**

A coffee-making apparatus comprising an electric throughflow heater, connected to a water reservoir, is

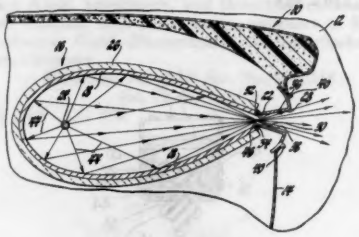


switched on and off in dependence on the water level by means of a swiveling float incorporating a mercury switch.

3,619,562
MOVABLE REFLECTOR INFRARED HEATER

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1970, Ser. No. 4,948
Int. Cl. H05b *1/00*
U.S. Cl. 219—348 **3 Claims**

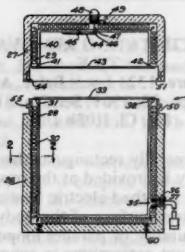


An infrared heater for warming the interior of an automobile having a stationary reflector which directs infrared radiation from a resistance wire element to pivotal reflecting surfaces adjacent and connected to the stationary reflector to redirect the infrared radiation into alternate portions of the automobile interior.

3,619,563
ELECTRICAL HEATER FOR A BEVERAGE

Robert E. Hirst, 68 Massasoit Ave., Cranston, R.I.

Filed Nov. 6, 1969, Ser. No. 874,507
Int. Cl. F24c *7/10*
U.S. Cl. 219—386 **4 Claims**



An electrical resistance element heater for a beverage adapted to be mounted upon a tray for use in an automobile

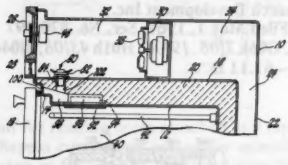
with electric current being supplied from the cigar lighter socket of the automobile or the like. The heater has an enclosing means comprising two sections with a heating coil in each section, the arrangement being such that when the sections are in closed positions, the coils are in series and connected to the source of electrical energy, whereas the circuit is broken when the sections are separated.

3,619,564

SELF-CLEANING OVEN WITH TEMPERATURE LIMITING PROTECTION SYSTEM

George W. Schauer, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 20, 1970, Ser. No. 56,485
Int. Cl. F27d *11/02*; **A21b** *1/00*, *1/22*
U.S. Cl. 219—413 **4 Claims**



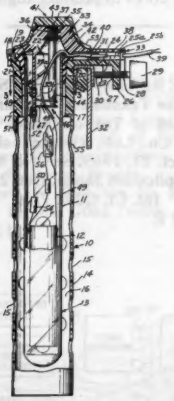
A self-cleaning oven having a single high limit thermostat which protects against an over-temperature condition inside the oven and a cooling fan failure outside the oven.

3,619,565

ELECTRIC IMMERSION HEATER

Anthony N. D'Elia, New York, and Edward M. Stolarz, Yorktown Heights, both of N.Y., assignors to Sternco Industries, Inc., Harrison, N.J.

Filed Aug. 19, 1970, Ser. No. 65,132
Int. Cl. H05b *3/06*, *3/08*, *3/02*
U.S. Cl. 219—523 **7 Claims**



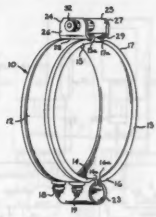
An electric immersion heater for use with home aquarium tanks. A glass tube containing at the bottom thereof an electric heating element is yieldably suspended within and in spaced relation to a heat-resisting apertured casing, the casing having a cover member with a depending bar extending into the tube and supporting the terminals of a thermostat. The casing and its said cover member have two complementary lateral extensions together forming a channelled passageway for electric conductors extending into the tube and connected to said terminals, said heating element being connected in series with said thermostat, there being a fuse in adjacent relation to and connected in series with said heating element. A knob member is rotatably mounted over said cover member and has a control rod in threaded engagement with the latter, the rod extending down into the tube and being operatively engageable with a contact arm of said thermostat, said knob being engageable with said cover member and thereby serving as a stop to prevent the control rod from excessively bending the engaged thermostat contact arm.

3,619,566

CYLINDRICAL ELECTRIC HEATER WITH CLAMPING MEANS

Thomas E. Finch, Acton, Ind., assignor to General Electric Company

Filed June 22, 1970, Ser. No. 48,051
Int. Cl. H05b *3/58*
U.S. Cl. 219—535 **8 Claims**



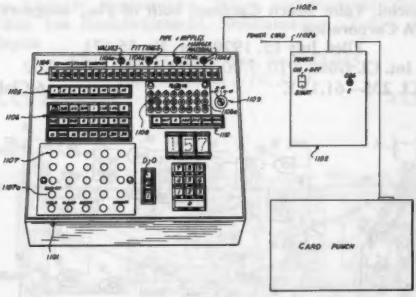
A cylindrical or band heater for heating a cylindrical object includes a pair of arcuate heater means each having a pair of ends with the ends of one heater means adjacent the ends of the other heater means when the heater means surround the object. Hooks are provided on the ends of both heater means and a spring is releasably received by the hooks on one pair of adjacent ends to connect such ends. An adjustable clamping means is releasably received by the hooks on the other pair of ends to adjustably connect such ends, the clamping means including a rotatable screw which when tightened draws the associated hooks and also said other pair of ends towards each other whereby the spring is placed in tension.

3,619,567

METHOD AND APPARATUS FOR ENCODING AND RECORDING ESTIMATING DATA

Richard T. Scott, 6161 Grove St., Omaha, Nebr.

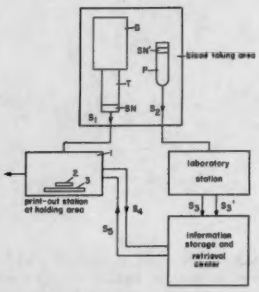
Filed May 1, 1969, Ser. No. 820,892
Int. Cl. G06k *1/02*, *15/18*
U.S. Cl. 235—61.1 **42 Claims**



A method and system apparatus for encoding the description of items and individual quantities thereof which are described by related variables. The system includes a control panel, remote power source and a terminating device such as a card punch or an online computer. When the system uses a card punch as the terminating device, punch cards are produced which have sufficiently encoded the description and quantity of components (used in building construction) thereon to enable the cards to be processed in small computers or bookkeeping machines for estimating purposes.

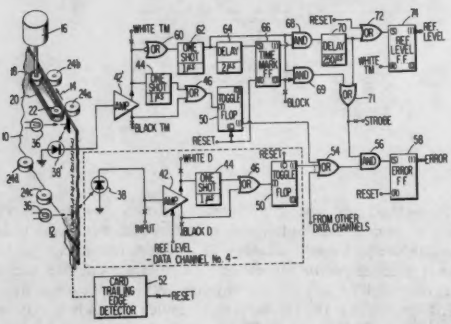
The method includes the steps of presetting the relationships between dependent and independent variables, labeling the origin of said items, describing the characteristics of each of said items, quantitizing the amount of each item described by said variables, and displaying visually the related variables prior to the final encoding processing of the information.

3,619,568
SYSTEM AND METHOD FOR IDENTIFYING AND LABELING BLOOD PACKS
John F. Taplin, 15 Sewall St., West Newton, Mass.
Filed May 6, 1969, Ser. No. 822,257
Int. Cl. G06k *3/02, 7/08;* **B41j** *3/28*
U.S. Cl. 235—61.9 R **11 Claims**



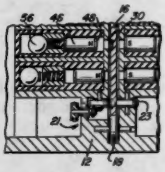
A system for automatically identifying and labeling the contents of blood packs designed to avoid human errors in the process of identifying and labeling of the contents of blood packs. The system includes an information storage and retrieval center having means for storing information at predetermined addresses and retrieving information from said addresses. It further includes a laboratory station having means for supplying all pertinent data needed for labeling blood packs to the aforementioned information storage and retrieval center. In addition the system includes a printout station where information is being retrieved from the information and retrieval center and automatically imprinted upon blood packs. The labeling of blood packs involves identification of the blood type and serologic data.

3,619,569
OPTICAL CARD-READING APPARATUS
Jacob George Hoehn, North Palm Beach, and Ronald Alfred Mancini, Palm Beach Gardens, both of Fla., assignors to RCA Corporation
Filed July 15, 1970, Ser. No. 55,171
Int. Cl. G06k *7/10, 5/00;* **G01n** *21/48;* **G06k** *9/02*
U.S. Cl. 235—61.11 E **6 Claims**



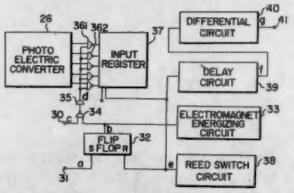
A mark sense card reader employs dual-threshold circuitry to indicate the presence, absence or inability to determine the presence or absence of marks such as pencil marks on a card. The circuitry includes a light-sensing transducer coupled to first and second differential amplifiers. The first such amplifier produces an indication only when a mark is definitely present. The second such amplifier produces an indication both when a mark is present and when the light level is such that no decision can be made as to whether or not a mark is present. The presence of this last indication concurrently with the absence of the other such indication means that no decision can be reached as to whether or not a mark is present. This situation may occur in cases of a poor erasure, or very light marks and in such cases the circuitry of the present disclosure causes the card to be rejected.

3,619,570
MAGNETIC READING APPARATUS
Gregory Grosbard, Long Beach, N.Y., assignor to International Research Development Inc.
Filed May 1, 1969, Ser. No. 820,997
Int. Cl. G06k *7/08, 19/08;* **H01h** *43/08;* **H04q** *3/72*
U.S. Cl. 235—61.11 D **16 Claims**



A code reading device for data processing cards employing magnetic cores that are displaceable transversely of a card inserted into an air gap between the confronting pole faces of the magnetic cores. In a code reading position of the card, information on the faces of the card may be read by exposure to the magnetic cores to establish, decrease or increase repulsive or attractive forces between the pole faces causing displacement of the cores to produce digital output signals.

3,619,571
TAPE READING-OUT SYSTEM
Soichiro Kage; Kenzo Takahashi; Tadahiro Tanaka, and Yutaka Nakazima, all of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 27, 1969, Ser. No. 869,774
Claims priority, application Japan, Oct. 29, 1968, 43/78452
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **19 Claims**



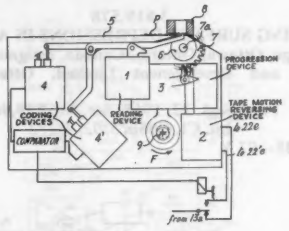
A tape reading-out system comprising a tape driving means equipped with a clutch having rotary shafts for allowing a tape stored with information to be moved forward, means for detecting signals directing the travel and stop of said tape from the displaced rotation of the rotary shaft of said clutch and a circuit enabling the rotary shafts of said clutch to rotate or stop and controlling the reading of information out of the tape by controlling the operation of said clutch using said detected directing signals.

3,619,572

PUNCHED TAPE READER UNIT

Jean-Pierre Murat, Argenteuil, France, assignor to Societe D'Applications Generals D'Electricite Et De Mecanique, Paris, France

Filed Nov. 28, 1969, Ser. No. 880,688
Claims priority, application France, Nov. 29, 1968, 175,882
Int. Cl. G06k 7/08
U.S. Cl. 235—61.11 C 3 Claims



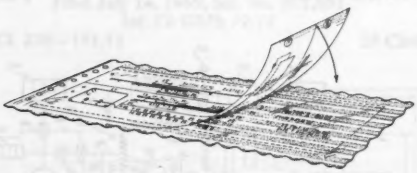
Reader unit for reading holes punched in a tape along rows transverse thereto comprising means for selectively advancing step-by-step in forward or backward directions, a group of readout levers terminated at their first ends by feelers of the punched holes of the tape, magnetic shield caps carried by the second ends of the readout levers, a group of reed switches each associated with a readout lever, a permanent magnetic field producing means for activating said reed switches and means for selectively positioning said readout levers and magnetic shield caps which they carry responsively to the punched holes of the tape in a first position in which the feelers pass through the holes and the caps shield the reed switches from the permanent magnetic field and a second position in which the feelers contact the tape and the caps do not shield the reed switches. The group of readout levers is divided into two subgroups respectively reading two words written in two successive rows of the tape. One word is stored and the word actually readout is compared to the stored word in a comparator. The comparator controls the direction of the advancing means.

3,619,573

DIRECTLY USABLE DOCUMENTS OR DRAWINGS OBTAINED BY MEANS OF COMPUTERS

Francois Philip, Saint-Mande; Jean Laporte, Avon, and Jean Clerc-Renaud, la Rochette, all of France, assignors to Etudes Techniques De Constructions A Fontainebleau, Saint-Mande, Val de Marne, France

Filed Apr. 23, 1969, Ser. No. 818,480
Int. Cl. G06k 19/06
U.S. Cl. 235—61.12 R 17 Claims



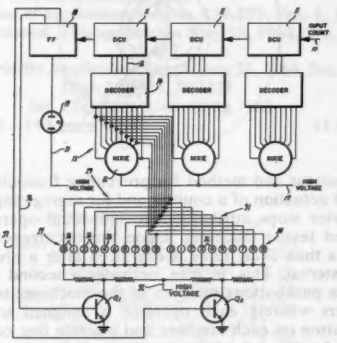
A system and method of producing documents composed of tabular data developed by means of a computer and also composed of other data, such as graphic data, produced separately from the first data by manual techniques or otherwise; the system and method include the coding of standard documents bearing the graphic or other data and arranging the graphic data on the standard documents in certain predetermined locations; developing tabulations of data by means of a computer and forming tabulation documents with the data in a predetermined arrangement and keyed to the standard document by means of coding and the relative locations of the data; preselecting by means of the coding the standard document corresponding to a particular tabulation document and displaying the data of said documents in overprinting relationship, whereby, if desired, a single combined document may be produced.

3,619,574

DIGITAL METER WITH AUXILIARY VISUAL ANALOG DISPLAY

Daniel J. Mindheim, San Jose, Calif., assignor to Time Systems Corporation, Mountain View, Calif.

Continuation-in-part of application Ser. No. 719,438, Apr. 8, 1968, now abandoned. This application Oct. 14, 1968, Ser. No. 767,311
Int. Cl. G06m 3/06; H03k 21/18
U.S. Cl. 235—92 EA 10 Claims



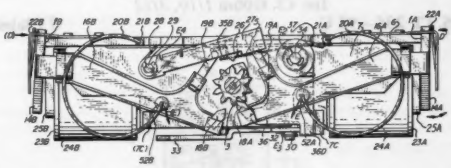
Digital meter having at least one decimal counting unit, digital display means giving a multidigit digital display of the count registered by the decimal counting unit, and analog display means giving an auxiliary display of the registered count. In the preferred embodiment, the auxiliary display is provided by the illumination of a light in a position corresponding to the value of the count displayed by the digital display means.

3,619,575

MAGNETIC COUNTER

Nagao Mizutani, No. 20-1 Asahigaaka-Danchi, 1376-46 Sandahigashicho, Hachioji-shi; Yoshiro Shimada, 1206 Matsuno Kimachi, Suginami-ku, Tokyo, and Masamitu Nojima, 1046 Ina Itsukaichimachi, Nishitama-gun, Tokyo, all of Japan

Filed Feb. 25, 1969, Ser. No. 802,055
Int. Cl. G06m 1/10, 3/14
U.S. Cl. 235—92 C 4 Claims



A magnetic counter capable of performing addition or subtraction, or both operations at a high speed, said magnetic counter being so designed that a cycle of advancing rotation of a counting element is effected in two steps, i.e., the first half of the advancing rotation is effected by one advancing pawl and the second half of the same is effected by another advancing pawl, and said first half of the advancing rotation in a plus and a minus directions are effected by different advancing pawls respectively.

3,619,576

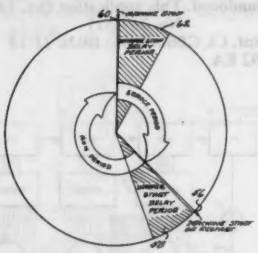
APPARATUS AND METHOD FOR SEGREGATING THE COUNTS OF SERVICE STOPS OF INDIVIDUAL OPERATORS AND FOR PREVENTING INACCURATE COUNTS

John V. Cauthen, Fayetteville, and Fujio Abe, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of application Ser. No. 484,622, Sept. 2, 1965. This application Nov. 18, 1969, Ser. No. 877,854

Int. Cl. G06m 3/12

U.S. Cl. 235—92 FP 37 Claims



Apparatus and method for preventing fraudulent or inadvertent actuation of a counter and for segregating the counts of service stops attributable to individual operators of associated textile machines. Upon the occurrence of a yarn break a time delay relay is energized after a predetermined time interval. This, in turn, activates a second relay which couples pushbuttons on each of the machines to respective counters wherein each operator is assigned to a specific pushbutton on each machine and wherein one counter is associated with each of a respective set of pushbuttons. Upon completion of the mending operation the operator's pushbutton is depressed which records a count on the associated counter at the same time that the machine is restarted. Also, upon depression of the push button another time delay relay is activated after a predetermined time interval has passed from the depression of the pushbutton. This predetermined time interval is computed to be approximately equal to that time in which a yarn break cannot occur after starting the machine. During this time interval the depression of the pushbutton at the machine will not register a count on the counter. Thus, upon starting up the machine a predetermined time interval must pass before a yarn break can occur, and when a yarn break does occur, a second predetermined time interval must elapse, while the operator is repairing the break, before depression of the associated pushbutton on the machine will result in the recording of an additional count on a respective counter.

3,619,577

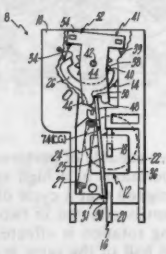
CLAPPER COUNTERWEIGHT

Ernest G. Hoffman, Hamden, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed May 21, 1969, Ser. No. 826,395

Int. Cl. G06m 1/10, 3/12

U.S. Cl. 235—92 C 7 Claims



An electromagnetic counting device having a rotary counter, an electromagnet with a U-shaped core and a coil encircling one of the legs of the core, a one-piece pivotal armature mounted aside the ends of the core legs and functioning as a clapper for the electromagnet and a verge for indexing the counter in stepwise fashion upon momentary energization of the electromagnet, and an inertial member rotatable on the counter shaft and having a radial arm with a bifurcated end receiving an edge of the clapper which provides for rotating the inertial member back and forth in conjunction with the pivotal movement of the clapper.

3,619,578

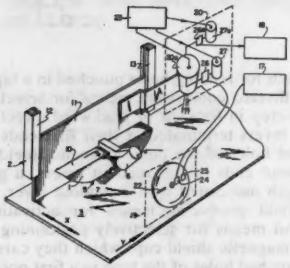
INDICATING SURFACE DEPRESSIONS IN A MATERIAL

Paul George, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Sept. 22, 1969, Ser. No. 859,965

Int. Cl. G06m 3/02, 1/272

U.S. Cl. 235—92 V 4 Claims



An apparatus for indicating the surface depression, for example, softwood veneer, wherein light from a microscope illuminator is directed between a straightedge and a surface of the veneer passing in sliding contact underneath the straightedge, a silicon diode detects light reflected above a predetermined intensity from underneath the straightedge as an indication that the depth of the depression is above a minimum, and an electronic counter counts the number of such depressions per unit length of veneer. A marker attached to the counter applies a black mark to the veneer whenever a predetermined number of such depressions is exceeded per unit length, and a further marker may be used to mark the veneer with a red dot at each unit length.

3,619,579

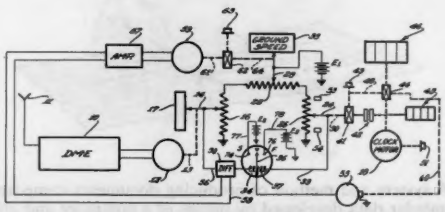
TIME OF ARRIVAL AND GROUND SPEED COMPUTER

Earl Stuart Perkins, Oak Brook, Ill., assignor to Butler National Corporation, Oak Brook, Ill.

Filed Oct. 28, 1969, Ser. No. 871,819

Int. Cl. G06g 7/78; G01s 9/44

U.S. Cl. 235—150.2 9 Claims



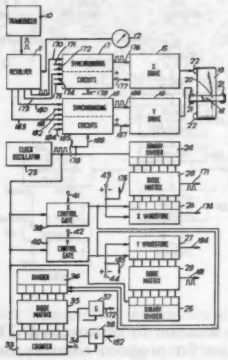
A computer for indicating ground speed and which receives input from distance measuring equipment and a clock and has an output which indicates if an indicated ground speed is high or low so that ground speed indicator may be adjusted to a correct value. A modification allows the estimated time of arrival to be indicated and a further modification includes a servo motor which is driven by any unbalance signals to indicate the correct ground speed.

3,619,580

NAVIGATION AIDS

Roy Thurston Swale, deceased, late of London, England, and Edwin Jack Barber, executor, Haslemere, England, assignors to Deca Limited, London, England

Filed Nov. 19, 1969, Ser. No. 878,070
Claims priority, application Great Britain, Dec. 3, 1968, 57,292/68
Int. Cl. G06f *15/50*
U.S. Cl. 235—150.27 7 Claims



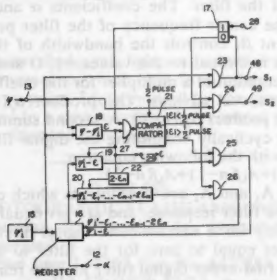
A navigational aid including a position display device driveable to indicate orthogonal position coordinates of an aircraft in response to received pulses from a resolver fed by a transducer that responds to air speed. For each coordinate direction a bidirectional counter stores an estimated component of wind velocity and controls by a diode matrix the feeding to drive means for the display of additional pulses at a rate proportional to the component of wind velocity. At the end of an elapsed time pulses are fed to the counters to correct the stored component of wind velocity and a number of pulses proportional to the product of the elapsed time and the correction to a respective counter is fed to the drive means for correcting each indicated coordinate. Thus the stored components of wind velocity are accurately adjusted automatically by correcting the indicated coordinates.

3,619,581

NUMERICAL CONTROL PULSE DISTRIBUTING SYSTEM FOR GENRATING AN APPROXIMATED PROFILE ON A WORKPIECE

Rokuro Kimura; Mikishi Kurimoto, and Tsuyoshi Koide, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, by said Kimura and Toyoda Koki Kabushiki Kaisha, by said Kurimoto and said Koide

Filed July 14, 1969, Ser. No. 841,401
Int. Cl. G05b *19/18*
U.S. Cl. 235—151.11 28 Claims



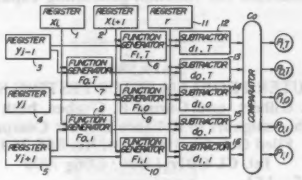
A pulse distributing system for generating an approximated profile on a workpiece by controlling the co-operational movements of the workpiece and a tool of a numerically controlled machine tool according to input data. Said system comprises computing means which may calculate one of each number-pair which represents a point used for pulse distribution and consists of pulse representation workpiece rotary angle and pulse representation distance between the axes of the workpiece and the tool when the other thereof is given. Another embodiment of the invention further comprises error checking means operable to maintain the error of approximation within allowable tolerance.

3,619,582

NUMERICAL CONTROL PULSE DISTRIBUTION METHODS

Takayoshi Iwamoto, Moriguchi-shi; Hiroaki Shiraki, Fuse-shi; Yoshitaka Nishimura, Neyagawa-shi, and Takuya Nasu, Hirakata-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of application Ser. No. 429,259, Feb. 1, 1965, now abandoned. This application May 23, 1968, Ser. No. 731,447
Claims priority, application Japan, Jan. 31, 1964, Jan. 31, 1964; 39/5124, 39/5125
Int. Cl. G06f *15/46*; G06g *7/28*
U.S. Cl. 235—152 11 Claims



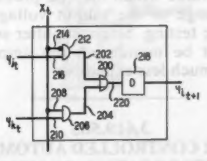
In a line tracing apparatus under the control of pulses distributed in at least one of the *X* and *Y* directions, a digital control pulse distribution method in which several possible points are imagined for transfer from a reference point. These points are compared with each other to discriminate the most approximate point among them. The next succeeding pulse is distributed based on the result of the discrimination.

3,619,583

MULTIPLE FUNCTION PROGRAMMABLE ARRAYS

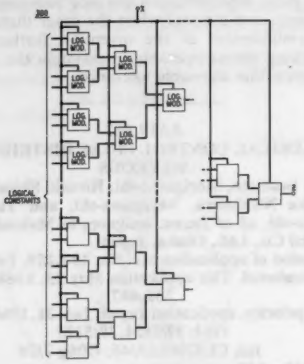
Thomas F. Arnold, Plainfield, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1968, Ser. No. 766,922
Int. Cl. G06f *1/02*
U.S. Cl. 235—152 19 Claims



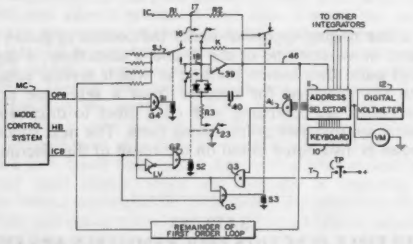
A circuit for generating an arbitrary sequential switching function includes an array comprising regularly intercon-

nected identical logic modules, each of which has a memory associated with it. Adaptations made at an edge of a two-dimensional construction of the array program the circuit to



generate a particular sequence of output signals in response to a sequence of input signals. Feedback paths may be included to increase the function-generating capability of the circuit.

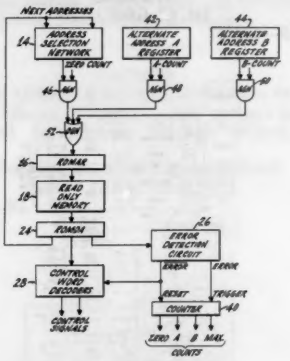
3,619,584
COMPUTER PROBLEM SETUP TESTING SYSTEM
Edward O. Gilbert, and Garnel F. Graber, both of Ann Arbor, Mich., assignors to Reliance Electric Company
Filed Oct. 13, 1969, Ser. No. 865,780
Int. Cl. G01r *15/00*; **G06g** *7/00*
U.S. Cl. 235—153 **10 Claims**



The method and apparatus for checking the connections and adjustments of an analog computer involves switching all integrators to a reset or initial condition mode, and then monitoring the output voltages of the integrators in succession. As the output voltage of a given integrator is monitored, the given integrator is connected to receive its integrand inputs and converted into a lag summer by connecting a resistor in parallel with the integrator capacitor, so that the output voltage changes from the initial condition value to a final steady-state value which may be precalculated. Observation of the change of the output voltage provides both static and dynamic testing. Since amplifier summing junction currents need not be monitored, the amplifier addressing structure may be much less expensive.

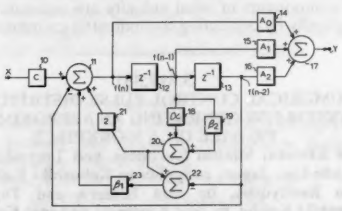
3,619,585
ERROR CONTROLLED AUTOMATIC REINTERROGATION OF MEMORY
Richard Harvey Edmondson, Cherry Hill, N.J., assignor to RCA Corporation
Filed Nov. 17, 1969, Ser. No. 877,237
Int. Cl. G11c *29/00*
U.S. Cl. 235—153 **10 Claims**

If an error is detected while reading data from a particular location in a memory, that same location is automatically read a given number of times. If an error does not occur during the reread cycles, the program continues and the succeeding memory locations are read in normal sequence. If an error still occurs in the data after the given number of reread cycles, however, a timer or counter automatically causes a



second memory location to be accessed. The latter can institute instructions for program recovery or for performing some other task such as causing a printout of the address at which the error occurred. The second location may also be preset to a given bit pattern so that if an error continues, the data read can be used to analyze the cause of error.

3,619,586
UNIVERSAL DIGITAL FILTER FOR LINEAR DISCRETE SYSTEMS
Marcian E. Hoff, Jr., Mountain View, and Patrick E. Mantey, San Jose, both of Calif., assignors to Research Corporation, New York, N.Y.
Filed Nov. 25, 1968, Ser. No. 778,643
Int. Cl. G06f *7/38*, *1/02*
U.S. Cl. 235—156 **21 Claims**

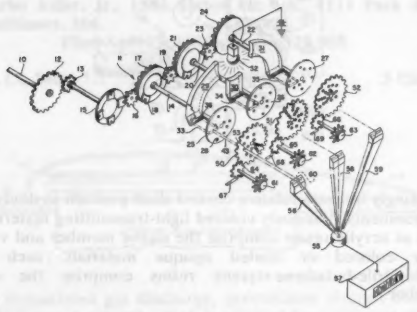


A second-order recursive digital filter is disclosed for use as a universal building block in which a first summing means is provided for cyclically computing the function $f(n)$= band gain of the filter. The coefficients α and β_2 together determine the center frequency of the filter passband while the coefficient β_1 controls the bandwidth of the filter. The coefficient α is limited to the values +1, 0 and −1 in order that implementation of a multiplier for the coefficient β_2 may result in some cost savings. The product $\alpha f(n-1)$ is then added to the product $\beta_2 f(n-1)$. A second summing means is provided for cyclically computing the digital filter output in accordance with the following equation:

$Y(n)=_0f(n)+A_1f(n-1)+A_2f(n-2)$

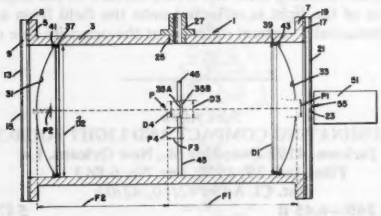
where A_0, A_1 and A_2 are coefficients which control the "-zeroes" of the filter response, and are set equal to +1, 0 and −1 respectively for a narrow-band digital filter. The coefficient β_1 is set equal to zero for the filter to operate as an oscillator. A first order digital filter may be readily provided by modifying the first and second summing means to cyclically compute the functions $f(n)=(n)+(n-1)+aD f(n-1)$ and $Y(n)=_0f(n)+A_1f(n-1)$, where D is a coefficient equivalent to $\alpha+\beta_2+1$.

3,619,587
RATE MULTIPLIER
Francis T. Chambers, III, Princeton, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Nov. 6, 1969, Ser. No. 874,828
Int. Cl. G06f 7/56
U.S. Cl. 235—164 27 Claims



A rate multiplier wherein the multiplicand is a shaft rotation and the multiplier is typically a manually inserted value. One or more code wheels having coded apertures formed therein for the passage of radiant energy are coupled to an input shaft for rotation. In one form, stationary selector wheels with decode apertures formed therein representing different multiplier values are adjusted to index with desired apertures in the code wheels to produce a pulse train representing the product. In another form, a bank of photosensors detect the radiant energy passing the code wheel apertures, and the decoding function is performed by an electromechanical switching system which establishes the desired multiplier values.

3,619,588
HIGHLY COLLIMATED LIGHT BEAMS
Keith W. Chambers, Pinawa, Manitoba, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Nov. 18, 1969, Ser. No. 877,752
Int. Cl. F21k 2/00
U.S. Cl. 240—1 R 10 Claims



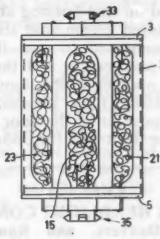
This application discloses a light source consisting of a gas-filled pressure vessel to which light from a laser is admitted and focused to a point. Light emitted by the gas at the focal point is directed by a mirror system to an output pupil to provide a highly collimated light beam.

3,619,589
PHOTOGRAPHIC FLASHLAMP UNIT
Donald W. Hartman, Warrensville, Pa., assignor to GTE Sylvania Incorporated
Filed June 1, 1967, Ser. No. 642,954
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 3 Claims

A flashcube in which the reflectors are of a thermoplastic material which will become distorted in the area around the

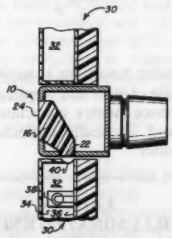
lamp by the heat from flashing to thereby provide ready recognition of a used lamp.

3,619,590
FLASHLAMP HOLDER
Charles Cornelis Edward Meulemans, and Cornelis Prijn, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,153
Claims priority, application Netherlands, Apr. 4, 1968, 6804718
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 7 Claims



A flashlamp holder for a plurality of flashlamps arranged in two series, with circuits and couplings for sequentially igniting the lamps in one series prior to igniting the lamps of the second series. Two separate couplings permit ignition of each series of flashlamps separately.

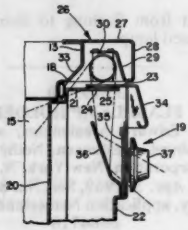
3,619,591
ILLUMINATED PUSHBUTTONS USING PIPED LIGHT
Victor E. Korski, Fort Worth, Tex., assignor to General Dynamics Corporation, Ft. Worth, Tex.
Filed Feb. 19, 1970, Ser. No. 12,762
Int. Cl. F21r 33/00
U.S. Cl. 240—2 2 Claims



A pushbutton-type switch providing illuminated indication of position or mode through utilization of piped light energy the energy being that previously unused excess light which was contained within the opaque coating of a transilluminated unit upon which these pushbuttons are employed. Through controlled escape of this excess light energy and piping of same to the desired pushbutton or surface the

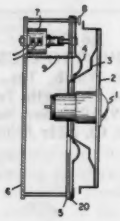
switch or pushbutton is self-illuminated, thus obviating any necessity for inclusion of supplemental lighting means.

3,619,592
WASHING MACHINE WITH ILLUMINATED INTERIOR
Robert M. Lamb, Jr., Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio
Filed Mar. 9, 1970, Ser. No. 17,471
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **3 Claims**



A washing appliance comprising a housing defining a washing chamber, a door hinged at the front of said housing, a trim member mounted on said housing above said door, illumination means mounted within said trim member, switch means electrically connected to said illumination means, means for actuating said switch and thus the illumination means in response to opening of the door, with the illumination means substantially fully illuminating the washing chamber in the open position of the door. The light may also illuminate the machine front with the door closed.

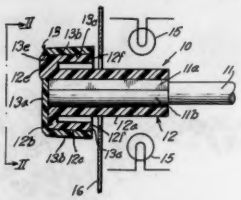
3,619,593
AUTOMOBILE HEADLIGHT COMPENSATOR
Arthur J. Hollis, Danvers, and Ronald Dana Cluett, Gloucester, both of Mass., assignors to Sylvania Electric Products, Inc.
Filed Apr. 14, 1969, Ser. No. 815,904
Int. Cl. B60q *1/10*
U.S. Cl. 240—7.1 LJ **1 Claim**



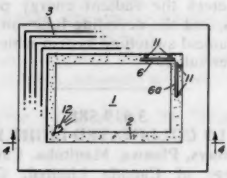
A pivotally mounted headlight is supported against a thermostatic bimetal pile. Upon the application of an electrical current to a resistance heater associated with the pile, the pile is activated and vertically deflects the headlight in a predetermined manner.

3,619,594
ILLUMINATED KNOB
Eugene S. Morez, River Grove, Ill., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.
Filed Jan. 30, 1970, Ser. No. 7,118
Int. Cl. E05b *17/10*
U.S. Cl. 240—2.13 **7 Claims**

A knob assembly for angular positioning of a rotatable control shaft comprising an outer opaque cap member having an eccentric aperture through a face portion thereof and an inner light transmitting sleeve member fitting within the cap and onto the control shaft. The sleeve member has an end projection protruding into the aperture so that light striking the sleeve member away from the end projection is transmitted through the sleeve member and is visible at the aperture on the cap face. The cap and sleeve members are rigidly attached to one another and the sleeve member end projection is angularly movable as part of the knob assembly to illuminatingly indicate relative control shaft position in dimly lit environments. Variously colored light-transmitting materials, such as acrylic resins comprise the sleeve member and variously colored or coated opaque materials, such as acrylonitrile-butadiene-styrene resins comprise the cap member.



3,619,595
INSTALLATION FOR THE ILLUMINATION OF PLAYING FIELDS
Richard A. Ott, Dotzheimer Landstr. 130, Wiesbaden-Frauenstein, Germany
Filed June 28, 1968, Ser. No. 741,100
Int. Cl. F21p *5/00*
U.S. Cl. 240—3 **2 Claims**



Illumination for a playing field is provided by a single source of artificial light supported at an elevated location at one side of the field. A portion of the light from the source is directed downwardly onto the entire surface of the field, and a portion of the light is reflected onto the field from a low-level substantially vertical reflector at the opposite side of the field.

3,619,596
ILLUMINATING COMPACT AND LIGHT SOURCE
Jack D. Jackson, 4102 Dauphine St., New Orleans, La.
Filed Jan. 29, 1970, Ser. No. 6,863
Int. Cl. A45d *42/10, 42/02*
U.S. Cl. 240—6.45 R **5 Claims**

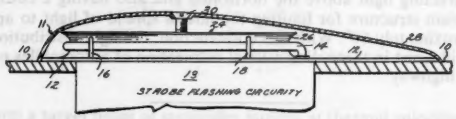
A battery and lamp are mounted externally on a compact and under an ornamental housing that may be integral with

the top of the compact and with the end of the said lamp extending beyond the edge of the housing and the case, and an electric switch completing an electric circuit between the lamp and battery and mounted on said housing.

3,619,597
STREAMLINED GAS DISCHARGE ANTICOLLISION AIRCRAFT BEACON

Charles Adler, Jr., 1506 Sutton Pl. Apt., 1111 Park Ave., Baltimore, Md.

Filed Apr. 15, 1970, Ser. No. 28,908
Int. Cl. B64d *47/02*
U.S. Cl. 240—7.7 **3 Claims**

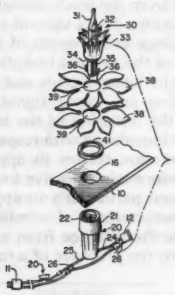


A streamlined gas discharge, anticollision aircraft beacon for high-speed aircraft which is adapted for mounting on an external portion of the aircraft and which includes an elongated concave trough reflector mounted adjacent to a gas discharge tube which can be excited to provide a stroboscopic light. The reflector and gas discharge tube are mounted relative to each other so as to provide a light field of 360° in a horizontal plane and of at least 140° in a vertical direction. A tear drop or oval-shaped light transmitting cover over the reflector and discharge tube provides extremely low aerodynamic drag, particularly when utilized with high-speed aircraft. A second embodiment of the beacon provides a light field of at least 180° in the vertical direction.

3,619,598
DECORATIVE LIGHT ORNAMENTS

Merril Hermanson, New York, N.Y., assignor to Mr. Christmas, Incorporated, New York, N.Y.

Filed Feb. 27, 1969, Ser. No. 803,011
Int. Cl. A47g *33/16*
U.S. Cl. 240—10 T **5 Claims**

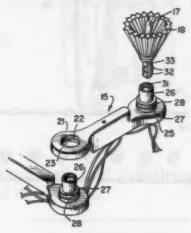


A decorative ornament formed with lights mounted on a shaped plastic holder having tapered holes therein with the socket press fitted from one side of the holder while the bulb is plugged in from the opposite side of the holder, in addition with the base portion of the bulb shaped to retain deflectors and washer as an aid for retaining socket and bulb in the holder.

3,619,599
DECORATIVE LIGHT SETS

Merril Hermanson, New York, N.Y., assignor to Mr. Christmas, Incorporated, New York, N.Y.

Filed Oct. 28, 1969, Ser. No. 871,818
Int. Cl. A47g *33/08*; **F21s** *7/00*
U.S. Cl. 240—10 R **14 Claims**

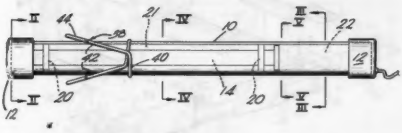


A hinged extensible multilight fixture having linking arms pivotally connected at their opposite ends with each linking member having a sleeve for receiving a lamp therein mounted on a base. The opposite end of the linking member has an end portion adapted to connect with the sleeve of the next pivotally attached linking member and with connecting wires between the terminals attached at each sleeve.

3,619,600
DIRECT CURRENT FLUORESCENT ILLUMINATING DEVICE

Roger L. Kryder, Fort Wayne, Ind., assignor to General Manufacturing, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1969, Ser. No. 814,630
Int. Cl. F21l *3/00*
U.S. Cl. 240—11.4 R **4 Claims**



A portable illuminating device utilizing a fluorescent lamp tube adapted to be powered by direct current and particularly suitable for use with automobiles, boats, and the like. The device basically consists of a light-transmitting housing tube of synthetic material which houses the lamp, and a direct current oscillator circuit is located at one end of the housing tube wherein the overall configuration of the device is cylindrical as to be readily handled and stored. The components of the circuit are arranged and constructed to permit accommodation to the configuration of the housing tube. Additionally, a metallic reflector is disposed adjacent the lighting tube which functions as a circuit output conductor to minimize the voltage required to initiate an arc in the lamp.

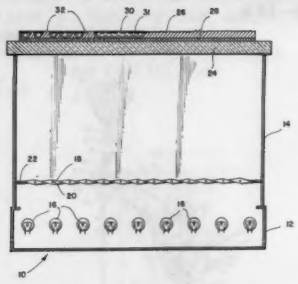
3,619,601
METHOD AND APPARATUS FOR POSTERIOR PHOTOCURING

Donald Paul Gush, Hyattsville, and Forrest Ashton Wessells, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of application Ser. No. 735,588, June 10, 1968. This application Oct. 28, 1968, Ser. No. 771,099
Int. Cl. F21v *9/00*, *11/04*; **G03b** *27/04*
U.S. Cl. 240—20 **11 Claims**

The disclosed invention is for an apparatus and improvements in a method of operating an apparatus for posterior photocuring a photocurable composition. The apparatus includes a housing having an actinic light source therein and

near one end is disposed a platform adapted to receive thereon a supported liquid photocurable composition which has been exposed to actinic light through an image bearing transparency and which is selectively insolubilized in the exposed portions thereof. The invention is especially useful for posterior photocuring a selectively exposed lamination in preparing a developable printing plate from a liquid photocurable composition.



3,619,602

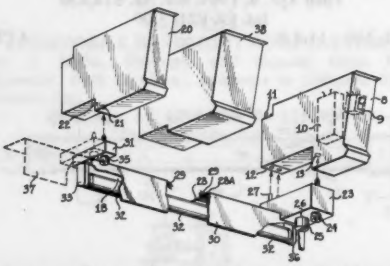
MODULAR LIGHTING FIXTURE

Leon G. Wilde, 3 Chandler Cir., Andover, Mass.

Continuation-in-part of application Ser. No. 707,084, Feb. 21, 1968, now Patent No. 3,497,281. This application Dec. 29, 1969, Ser. No. 888,677

Int. Cl. F21v *21/08*

U.S. Cl. 240—52.1 **6 Claims**



A modular lighting assembly including an elongated support member, a similarly elongated light directing shade and modular enclosures for supporting the ends of the support members. At least one of the modular enclosures contains the lamp ballast, switch elements and electrical connectors necessary to control the supply of electrical power to the lighting assembly. The assembly also has an elongated channel which carries the electrical wiring for interconnecting the end members of the lamp sockets. Alternatively, the lighting assembly may have several lamps arranged in end-to-end alignment.

3,619,603

STREET-LIGHTING LUMINAIRE

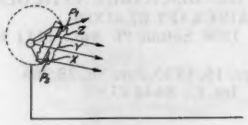
Herbert A. Odle, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.

Continuation of application Ser. No. 581,579, Sept. 23, 1966, now abandoned. This application May 7, 1969, Ser. No. 824,743

Int. Cl. F21v *5/00*

U.S. Cl. 240—106 R **2 Claims**

A luminaire to be used in low mounted rail units. The luminaire has a refractor which directs light from a light source onto a road, and this refractor has a first area for lifting light toward a beam direction under the horizontal and includes a cutoff prism structure for limiting the lateral distribution of this light to approximately 60°. The refractor has a second area for transmitting light, with substantially no effect thereon, over a lateral distribution spread substantially through a 90° fan. The refractor also has a third area for directing light above the horizontal and also having a cutoff prism structure for limiting the lateral spread of light to approximately 60°. With this construction, the light distribution will assist in three-dimensional delineation of automobiles on a highway.



3,619,604

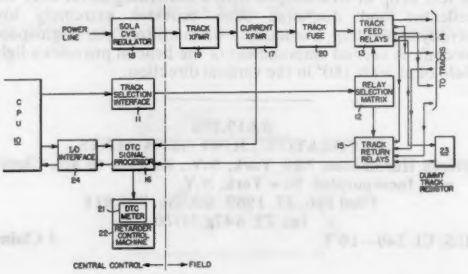
DIGITAL DISTANCE TO COUPLING DETECTION

John H. Auer, Jr., Fairport, and Jerry P. Huffman, Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,520

Int. Cl. B61l *25/02, 29/32*

U.S. Cl. 246—122 R **7 Claims**



Apparatus for detecting the impedance of an electrically energized track circuit has been provided wherein a receiver coupled to the track circuit at a reference point is responsive to received energy from the track circuit and means coupled to the receiver provides direct current signals representative of current and voltage components of the received energy. The improvement of the present invention includes an interface responsive to initiatory signals and to the direct current signals for providing an output signal, the occurrence of which relative to the initiation of the interface means gives indication of track impedance with respect to time.

The present invention relates to apparatus for detecting and transmitting information relative to the impedance of an electrical system and particularly to apparatus for detecting the impedance characteristic of a railroad track circuit in order to determine the distance from a reference point to a shunt occasioned by the presence of a railroad vehicle.

3,619,605

MASS SPECTROMETER METHOD AND APPARATUS EMPLOYING HIGH ENERGY METASTABLE IONS TO GENERATE SAMPLE IONS

Charles F. Cook; Thomas W. Schmidt, and Jack P. Guillory, all of Bartlesville, Okla., assignors to Phillips Petroleum Company

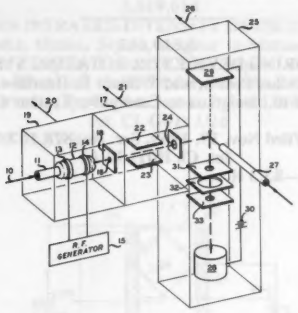
Filed June 25, 1969, Ser. No. 836,444

Int. Cl. H01j *37/08;* **B01d** *59/44*

U.S. Cl. 250—41.9 **8 Claims**

Metastable particles of high kinetic energy are produced by accelerating a stream of charged rare gas molecules, and contacting the accelerated stream of charged rare gas

molecules, thereby producing metastable high kinetic energy particles which are directed perpendicularly into contact

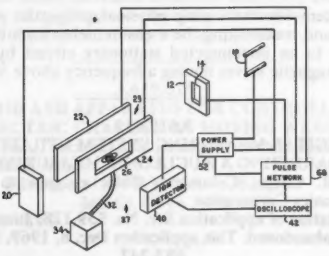


with a target beam of molecules moving at thermal velocities, the resulting ions being analyzed by a mass spectrometer.

3,619,606
ION SOURCE FOR TIME-OF-FLIGHT MASS SPECTROMETER

William H. Shriner, Blanchester, Ohio, assignor to The Bendix Corporation

Filed Oct. 6, 1969, Ser. No. 863,880
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 TF **7 Claims**



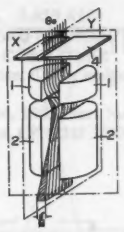
A method and apparatus for eliminating unwanted signals (noise) at a mass spectrometer output by improving the formation of ions in a mass spectrometer with a pulse forming network which applies voltage pulses to the control electrode and the backing plate and accelerating electrode of the ionization region. The pulses are oriented in time so that voltages are approximately zero at the backing plate and accelerating electrode during the presence of voltage pulses at the control electrode which accelerate electrons into the ionization region. The magnitudes of the pulses applied to the backing plate and accelerating electrode are such that an electric field is periodically established therebetween to accelerate ions from the ionization region with the durations of the pulses oriented in time so that the electric field established by the pulses has a duration less than the duration of the negative voltage pulse applied to the backing plate.

3,619,607
ELECTRON MICROSCOPE INCLUDING AN ELECTROMAGNETIC ELECTRON ENERGY ANALYZING LENS

Takeo Ichinokawa, Yurigaoka Danchi 35-304, No. 716 Takaishi, Kawasaki-shi, Kanagawa-ken, Japan

Continuation of application Ser. No. 708,851, Feb. 28, 1968, now abandoned. This application June 24, 1970, Ser. No. 49,575
Claims priority, application Japan, Mar. 30, 1967, 42/19534
Int. Cl. H01j *37/26*
U.S. Cl. 250—49.5 A **4 Claims**

Apparatus for analyzing the energy of an electron beam in an electron microscope includes a cylindrical lens of the magnetic field type inserted additionally or in place of a conventional intermediate lens, and a slit member cooperating

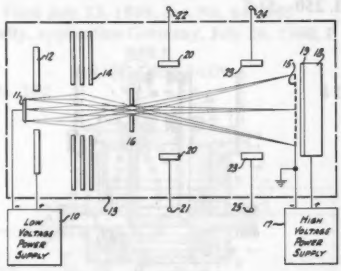


with said cylindrical lens, said cylindrical lens being excited under preselected conditions.

3,619,608
MULTIPLE IMAGING CHARGED PARTICLE BEAM EXPOSURE SYSTEM

Eugene R. Westerberg, Menlo Park, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Aug. 4, 1969, Ser. No. 847,326
Int. Cl. H01j *37/12*
U.S. Cl. 250—49.5 C **7 Claims**



An electron source illuminates a pattern mask having a desired aperture pattern therein. Electrons passing through the pattern mask impinge upon a mesh screen. A high-voltage electrical source is connected between the mesh screen and an electron-sensitive resist coated substrate to produce a strong electrical field therebetween. Each hole in the mesh screen acts as an electron lens for producing an image of the pattern mask on the electron-sensitive resist, thus resulting in an array of exposed images on the electron-sensitive resist. Alternatively, an ion source may be used with an ion-sensitive resist coated substrate or ions may be implanted directly into a substrate.

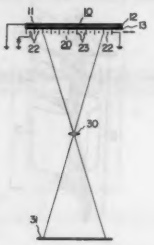
3,619,609
CORONA DISCHARGE DEVICE FOR ELECTROPHOTOGRAPHY EMPLOYING INTERLEAVED DISCHARGE ELECTRODE ELEMENTS AND COUNTER ELECTRODE ELEMENTS

Shiro Uehara, Tokyo-to, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

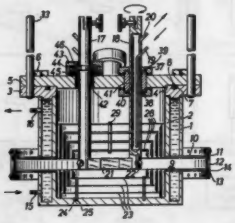
Filed Nov. 21, 1969, Ser. No. 878,788
Claims priority, application Japan, Nov. 25, 1968, 43/102602
Int. Cl. H01j *37/26*
U.S. Cl. 250—49.5 GC **3 Claims**

In a corona discharge device for electrophotography comprising a corona discharge electrode and a counter electrode for depositing electric charge on a photosensitive element upon which a light image is projected through the corona discharge device, both the corona discharge electrode and counter electrode are composed of parallel conductors which

are moved at high speed while the light image is being projected upon the photosensitive element through the corona discharge device to eliminate the effect of the shadow thereof.



3,619,610
SAMPLE SUPPORTING MEANS FOR HIGH-TEMPERATURE X-RAY DIFFRACTOMETER
Constantin Politis, Hochstetten, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany
Filed May 8, 1969, Ser. No. 823,131
Claims priority, application Germany, May 8, 1968, P 17 73 377.6
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **5 Claims**

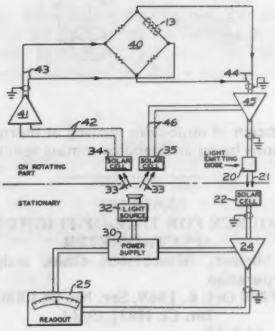


In a diffractometer where a sample carrier is in the form of a strip or wire spanned between two electrodes for resistance heating of the carrier, one of the electrodes is placed under a torsional bias to accommodate thermal expansion of the carrier by a winding of added length of carrier onto the torsionally biased electrode.

3,619,611
X-RAY FILM MARKER COMPRISING AN X-RAY FILTER AND RECESSED INDICES FILLED WITH X-RAY OPAQUE MATERIAL
Graham Hall, 21111 Dolores St., Sp. 125, Torrance, Calif.
Filed Nov. 12, 1969, Ser. No. 875,785
Int. Cl. G03b *41/16*
U.S. Cl. 250—67 **16 Claims**

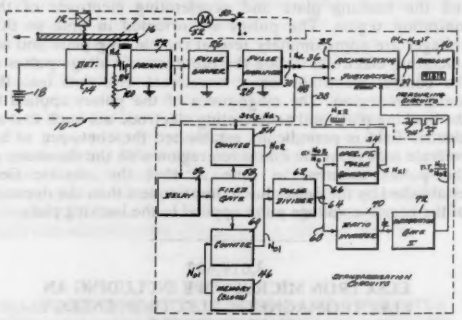
A marker positionable adjacent recording material and between the material and a source of X-ray radiation, the marker having a body of material relatively transparent to the radiation with a broad area depression in which recesses in the form of film identifying characters are provided. A metallic material relatively opaque to the X-ray radiation is disposed in the recesses and a cover plate of material relatively transparent to this radiation is disposed in the depression over the recesses, the plate having in an exposed surface thereof indentations corresponding to the aforementioned identifying characters.

3,619,612
MONITORING DEVICE FOR ROTATING SYSTEMS
William H. Belke, Peoria, and William E. Dearlove, Washington both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 19, 1969, Ser. No. 878,107
Int. Cl. H01j *39/12*
U.S. Cl. 250—83.3 H **7 Claims**



A system for measuring physical properties of rotating devices and transmitting the measurements from the rotating member to an unconnected stationary circuit by means of electromagnetic waves having a frequency above 3×10^{12}Hz.

3,619,613
DIGITAL MEASURING SYSTEM UTILIZED IN STANDARDIZING A NUCLEONIC MEASURING GAUGE
Henry R. Chope, Columbus, Ohio, assignor to Industrial Nucleonics Corporation
Continuation of application Ser. No. 559,128, June 21, 1966, now abandoned. This application Dec. 8, 1969, Ser. No. 883,247
Int. Cl. G01n *23/16*
U.S. Cl. 250—83.3 D **41 Claims**



A system for measuring the basis weight per unit area using a nucleonic gauge with a digital measuring circuit for counting detector output pulses to obtain a digital indication of the instant measurement. The pulse-counting circuit operates to take the difference between the detector output pulses during a counting period and the pulses from and operating point or reference pulse generator. To effect standardization, any decrease in the detector output pulse rate is measured while the material is out of the radiation path and the

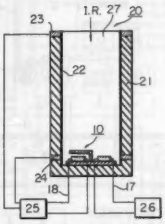
reference pulse rate is decreased accordingly or the counting periods are increased inversely of that decrease, or both.

3,619,614

AN INFRARED INTENSITY DETECTOR

Eiso Yamaka, Osaka, Japan, assignor to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Dec. 19, 1969, Ser. No. 886,573
Claims priority, application Japan, Dec. 25, 1968, 44/277
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 H **2 Claims**



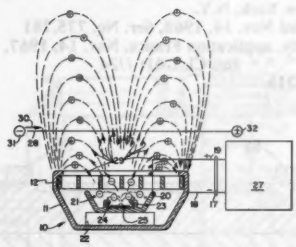
An infrared intensity detector having a pair of detector elements, one shielded from and the other exposed to an incoming infrared radiation, and a thermostatted black body reference source of a characteristic temperature. The detector elements are made of a semiconductor having a remarkable temperature dependence of resistivity within a limited temperature range around the characteristic temperature. The detector offers increased detection sensitivity and finds a wide variety of applications especially where it is intended to measure an object of relatively low temperature.

3,619,615

METHOD AND APPARATUS FOR CONTROLLING ELECTRIC CHARGES ON MOVING WEBS

Walter Y. Fish, Tucson, Ariz., assignor to Nucleonic Industries, Tucson, Ariz.

Filed June 16, 1969, Ser. No. 833,307
Int. Cl. G21h 5/00
U.S. Cl. 250—106 **28 Claims**



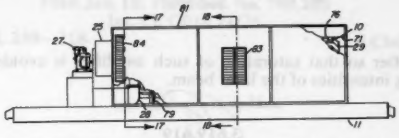
Ions of determinable polarity and concentration are applied to a material or member, such as a nonconductive moving web, to impart a resultant or residual charge, in a preferred embodiment a neutral charge. The resultant charge is continuously monitored and fed back to a power source and controller, which invert the polarity of the monitored charge and apply it to an ion emitter, preferably comprising a radioactive isotope. To obtain a predominance of selected ions for application to the member, an electrostatic field is created in the immediate vicinity of the ion emitter and the member. One pole of this field is within the emitter and the sign of this pole is made to correspond to that of the selected ions. Ions of the opposite, unselected, polarity are attracted to this pole and it repels the selected ions. The opposite pole of the field is so disposed in relation to the emitter and the member that the selected ions seeking this pole are directed into contact with and are captured by the member.

3,619,616

FORCED AIR COOLED RADIOACTIVE MATERIALS CONTAINER

Carrel W. Smith, San Jose, Calif., assignor to General Electric Company

Filed Jan. 24, 1969, Ser. No. 793,670
Int. Cl. G21f 5/00
U.S. Cl. 250—108 **2 Claims**



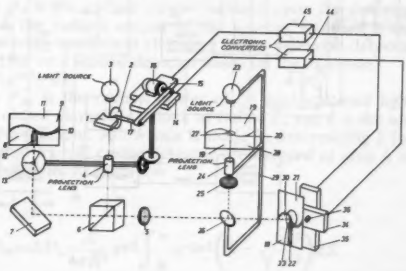
An improved radioactive materials container system having a system of ducts and nozzles for efficient forced air cooling of a finned radioactive materials container.

3,619,617

PROJECTED IMAGE GRINDING MACHINE

Alfred Kolb, Haus am Tannenberg, Wertheim(Main), Germany

Filed July 23, 1969, Ser. No. 843,965
Claims priority, application Germany, July 26, 1968, P 17 52 859.5
Int. Cl. G05b 1/00
U.S. Cl. 250—202 **4 Claims**



The tool of a grinding machine is guided by a color-sensitive photoelectric sensor which scans an image of the actual shape of a workpiece in one color superimposed on an image of the desired shape of the workpiece in another color complementary to said one color.

3,619,618

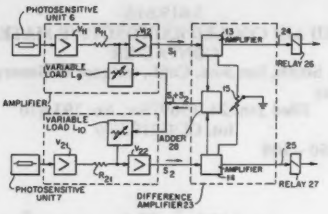
LASER SYSTEM FOR CONTROLLED GUIDANCE OF MOBILE MACHINE

Jurgen Thorn, Haar, and Horst Moritz, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 6, 1970, Ser. No. 17,174
Claims priority, application Germany, Mar. 17, 1970, P 19 13 398.3
Int. Cl. G01j 1/20
U.S. Cl. 250—203 **4 Claims**

A receiver affixed to a mobile machine comprises at least two spaced photosensitive units, positioned transversely to a reference plane formed by a flared modulated laser guide beam, on on each side of the reference plane. An initial amplifier having a variable load is connected to the photosensi-

tive units and a difference amplifier is connected to the amplifier. The difference amplifier varies the load of the initial



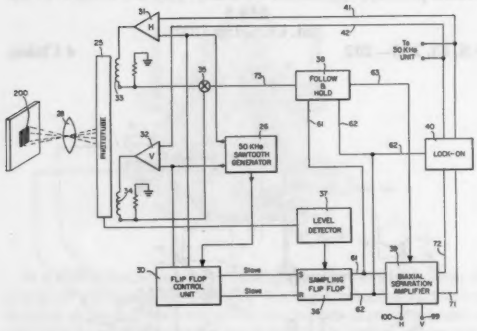
amplifier so that saturation of such amplifier is avoided at strong intensities of the laser beam.

3,619,619

AUTOMATIC BIAXIAL ELECTROOPTICAL DISPLACEMENT INDICATOR

John P. Skurla, Warminster, Pa., assignor to Physitech, Inc., Willow Grove, Pa.

Filed June 27, 1969, Ser. No. 837,243
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 CT **6 Claims**



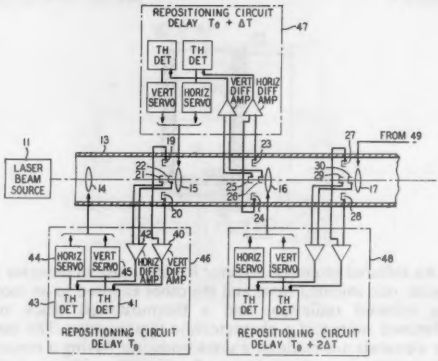
An apparatus is disclosed for simultaneously detecting and measuring biaxial displacement, as for example, vibration of a physical body, or angular rotation of a shaft. An image analyzer tube is employed which is focused on the optical discontinuities of a two-dimensional target placed on the body. For measurement of angular rotation, a mirror placed on the shaft reflects the image of the remotely placed target to the tube. Control circuitry causes the system to sweep the field of view until orthogonal optical discontinuities are detected, and then to lock onto and follow the location of the target. Deflection signals are applied alternately to the horizontal and vertical yokes of the tube to scan the image across the tube aperture at a rate which is high relative to the expected rate of vibration. The value of the deflection signal is measured at the instant the optical discontinuity crosses the aperture and from this sampled measurement of the deflection signal an information signal is derived which is indicative of the position of the image at that instant. The resulting signal, which carries combined information of both axial positions, is processed by a biaxial separation amplifier which yields two distinct signals representing the orthogonal movements.

3,619,620

OPTICAL GUIDING APPARATUS COMPRISING AN OPTICAL TRANSMISSION PATH AND CONTROLLERS HAVING DELAY TIMES THAT VARY IN A SELECTED SEQUENCE

Douglas H. Ring, Middletown Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 29, 1968, Ser. No. 756,274
Int. Cl. G01b *11/27*; **H01j** *39/12*
U.S. Cl. 250—208 **5 Claims**



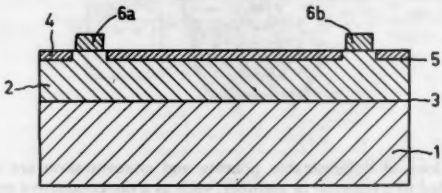
Coordinated control of light beam repositioning elements in an optical guiding apparatus is achieved by stepped controllers having delay times that increase in the downstream order. Such sequences of stepped controllers are separated by linear controllers that are relatively precise but few in number.

3,619,621

RADIATION DETECTORS HAVING LATERAL PHOTOVOLTAGE AND METHOD OF MANUFACTURING THE SAME

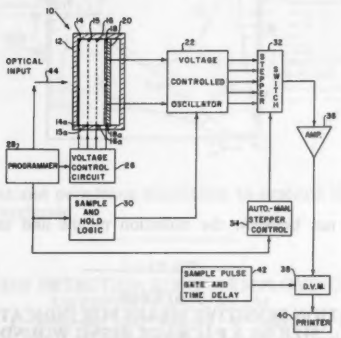
Gerard Maret, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1968, Ser. No. 775,781
Claims priority, application France, Nov. 14, 1967, 128112
Int. Cl. G01t *1/24*
U.S. Cl. 250—211 **7 Claims**



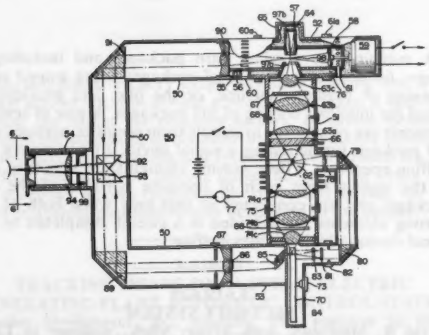
A radiation detector is described utilizing the lateral photovoltage effect. It comprises a semiconductor body having parallel to its major surface there zones alternating in conductivity type forming two PN-junctions, which become back biased during operation. The middle zone is accessible at a major surface and two contacts are made to it, with the result that the potential difference existing across these contacts is an indication of the point of impact of the incident radiation. The construction described of three zones forming two junctions offers the advantage of increasing the useful volume of the detector and increasing its sensitivity.

3,619,622
BRIGHTNESS DISTRIBUTION ELECTRON STORAGE TUBE
Harry O. Pfeiffer, North Canton, and Richard H. Wills, Tallmadge, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Dec. 10, 1969, Ser. No. 883,707
Int. Cl. H01j *39/12*
U.S. Cl. 250—213 VT **5 Claims**



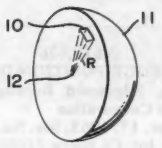
The tube of the invention is a device which is designed to perform the function of indicating the scene brightness distribution information of an input image in a graphic configuration by utilizing a storage grid in proximity focus to an anode and cathode and collector mesh so that deflection circuitry and coils are not necessary. A uniform flood is utilized to erase and project image information stored on the grid. Suitable logic control to effect sampling on a solid or segmented anode provide the readout characteristic desired.

3,619,623
EXAMINATION OF FLUID SUSPENSIONS OF PARTICULATED MATTER
Roy W. Huston, 21 James St., Winchester, Mass.
Filed Aug. 20, 1968, Ser. No. 753,920
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **9 Claims**



Apparatus for the examination of fluid suspensions of particulate matter includes means establishing a thermally stabilized region for containing a sample of the fluid to be examined, means for passing a beam of light into the region and means for viewing fluid in the region at an angle to the beam of light. The means defining the region may include thermal energy traps and may include thermal energy traps and may include parallel spaced members establishing a narrow thermally stabilized viewing region. The apparatus may include comparator means comprising graded reference standards which can be illuminated by an independent light source or by an independently adjustable beam from the light source which illuminates the viewing region. A photosensitive monitor, such as a photodetector cell, can be illuminated by light from the viewing region to provide a comparison with the reference standards of fluid suspensions of particulate matter.

3,619,624
INSTRUMENT FOR MEASUREMENT OF OPTICAL CHARACTERISTICS OF WATER
Glenn P. Sorenson, Woodside, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.
Filed Jan. 10, 1969, Ser. No. 790,280
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **6 Claims**



Apparatus for determining underwater optical characteristics is disclosed. One is the absorption coefficient (a) using a small cosine detector of area A at a distance R from a small (quasi-point) source based on the equation:

$$P_d = P_0 \frac{Ae^{-aR}}{4\pi R^2}$$

where P_d is the radiant power incident upon the detector and P_o is the radiant output of the source. Another is the backscattering coefficient (b) using either the same detector rotated 180° or a second detector based on the equation:

$P_{BZ} = P_o e^{(aZ)} b\, dZ$

where P_{BZ} is the radiant power of all backscattered light from a volume element dZ thick at radius Z, and a is the absorption coefficient. Allowance is made in determining b for the fact that a small cosine detector is employed of area A in accordance with the equation

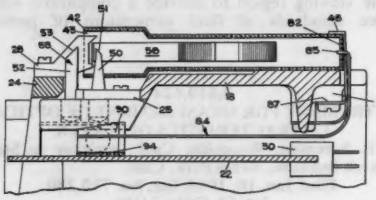
$$P_D = bP_o \frac{A}{4\pi R^2} e^{aR} \int_R^\infty e^{-2aZ}\left(1-\sqrt{\frac{R^2}{Z^2}}\right)dZ$$

where P_D is the radiant power incident upon the detector. By using spectral filters in the detectors, coefficients a and b can be measured as functions of optical wavelength. The coefficient of total scattering s may be determined by measuring the coefficient of attenuation α and subtracting from it the absorption coefficient a.

3,619,625
TAPE RECORDER APPARATUS WITH OPTICAL SENSING MEANS FOR TAPE CONTROL
Robert E. Wood, Ann Arbor, Mich., assignor to Sycor Inc., Ann Arbor, Mich.
Filed Jan. 21, 1969, Ser. No. 792,281
Int. Cl. G11b *5/00*
U.S. Cl. 250—219 F **18 Claims**

A tape recorder/reproducer apparatus, generally including spindles for mounting recording tape reels and drive means for moving the tape from one reel to the other, and particularly including light sources and light sensors positioned immediately beneath the position of the tape and light guide means for directing the light from such source to that portion of tape positioned between the reels and back to one sensor, and also with light guide means for directing light from such

source to the tape wound on one of the reels and back to another such sensor, for extremely accurate, automatic

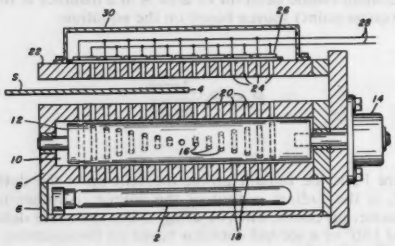


recording and reproducing control functions with respect to tape position.

3,619,626
DIGITAL EDGE POSITION DETECTOR

Ralph G. Rudolph, Edgewood Borough, Pa., assignor to United States Steel Corporation

Filed Mar. 17, 1969, Ser. No. 807,543
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 WD **3 Claims**



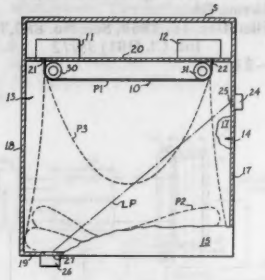
An edge position detector includes a sequencing cylinder positioned on one side of a moving strip. The cylinder is rotated around its longitudinal axis and has a plurality of spaced apart radial holes through it, arranged in a helical pattern. Light from a light source passes through the holes in the cylinder and matching collimating holes. Where the resultant light pulses are not obscured by the strip, they pass through another set of matching collimating holes and impinge upon a photoelectric cell. The light pulses are converted into electrical pulses and counted during a given angular rotation of the cylinder to indicate the position of the edge of the strip as the number of holes beyond the edge of the strip during the counting period.

3,619,627
RECORDING-REPRODUCING SYSTEM WITH PHOTOELECTRIC TAPE LOOP SENSING

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Continuation-in-part of application Ser. No. 727,784, May 9, 1968, now abandoned. This application Aug. 18, 1969, Ser. No. 852,970
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 L **10 Claims**

What is disclosed is a tape control device for a recording-reproducing system in which a tape is pulled from a tape magazine by a tape driving device. The tape control device includes a radiation means for emitting energy to which the tape is opaque and a control means responsive to the energy from the radiation means for rendering the tape driving device inoperative when further operation of the tape driving device will cause tape breakage. The radiation means and the control means are positioned relative to each other so that in some positions of the tape within the tape magazine the tape is between the radiation means and the control means while in other positions of the tape within the tape magazine the

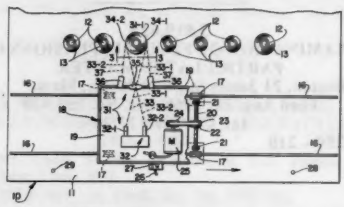


tape is not between the radiation means and the control means.

3,619,628
RADIATION SENSITIVE MEANS FOR INDICATING THE SIZE OF A PACKAGE BEING WOUND

William R. Whitney, Cranston, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of application Ser. No. 671,918, Sept. 15, 1967, now abandoned. This application Nov. 18, 1969, Ser. No. 877,678
Int. Cl. G01b *7/12*
U.S. Cl. 250—219 S **8 Claims**



A machine for winding yarn packages and including a device for scanning a series of packages being wound on a spinning or twisting machine, or the like, and providing a signal for initiating doffing of full packages. A pair of sensing elements are responsive to signals from opposite portions of a full package for actuating a signal device to commence the doffing operation. These sensing elements are sensitive, one to the signals from each of opposite portions of the full package, and are connected so that only when both of the sensing elements are actuated is a circuit completed to the signal device which initiates doffing.

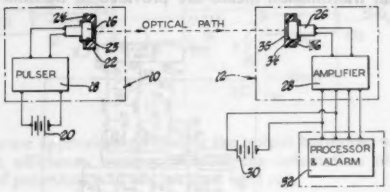
3,619,629
SECURITY SYSTEM

David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.

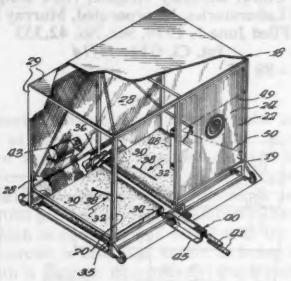
Filed Apr. 30, 1969, Ser. No. 820,378
Int. Cl. G08b *13/00*
U.S. Cl. 250—221 **10 Claims**

An electrooptical intruder detection system including alignable emitting and detecting elements, such as semiconductor diodes. Each element is disposed in a holder member having a semispherical head portion which cooperates with a mounting plate and retainer member to provide the alignment function. In addition, the emitting element may be mounted in an adapter member which is axially adjustable

relative to the holder member. Installation in an electrical outlet having various apertures for exposing the electrooptical element and permitting connection to external electrical devices is preferred.



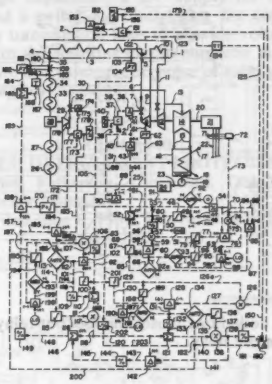
3,619,630
ARROW DETECTION SYSTEM EMPLOYING A SWEEPING LASER BEAM
David P. J. McLeod, and Patrick J. Murphy, both of Muskegon, Mich., assignors to Brunswick Corporation
Filed Feb. 14, 1969, Ser. No. 799,453
Int. Cl. G06m 7/00; G01p 3/68
U.S. Cl. 250—222 **13 Claims**



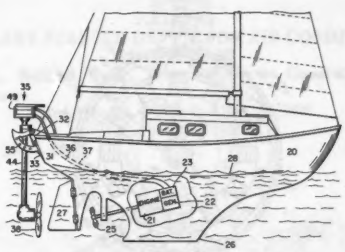
An automated archery range including a firing line from which arrows are shot toward a penetrable target, a backstop behind the target for stopping arrows, an arrow collector beneath the backstop, an arrow return conveyor for receiving arrows from the collector and returning them toward the firing line, and an arrow storage quiver adjacent the firing line for receiving arrows from the conveyor and storing the arrows in upright positions readily accessible to the archer.

3,619,631
TRACKING MEANS FOR A STEAM ELECTRIC GENERATING PLANT AUTOMATIC CONTROL SYSTEM
Charles Strohmeyer, Jr., Reading, Pa., assignor to Electrodyne Research Corporation, Reading, Pa.
Filed Aug. 21, 1970, Ser. No. 65,886
Int. Cl. G05b 7/00
U.S. Cl. 290—40 R **6 Claims**

The invention provides a means for balancing a complex steam electric generating plant automatic control system when in the manual tracking mode before transfer to automatic. The tracking system utilizes the normal automatic integral functions to set demands for generation, governor valve position, feedwater flow and heat input to the steam generator equal to actual conditions prior to transfer. Thus, after transfer the system is immediately ready to perform its normal control functions without having to reposition normal working integrals from generation, pressure or temperature errors to satisfy unbalances internally within the system which existed at time of transfer.



3,619,632
OUTBOARD GENERATOR UNIT FOR SAILBOATS
Raymond A. Labombarde, Daniel Webster Hwy., Nashua, N.H.
Filed June 2, 1969, Ser. No. 829,240
Int. Cl. F03b 13/10
U.S. Cl. 290—43 **9 Claims**

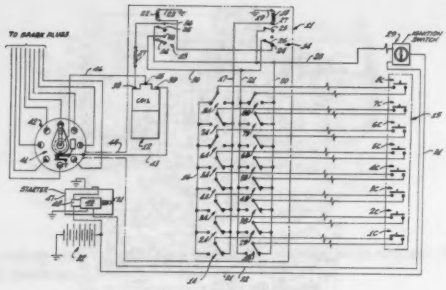


Power generating apparatus suitable for use on sailboats and the like comprising a relatively large propeller means used as a submerged prime mover and rotatably mounted on the lower end of a substantially vertical, tubular housing containing a drive shaft, a gear assembly for converting said rotary motion of said propeller into a substantially increased rate of revolution for driving an alternator or generator mounted proximate the other end of the shaft above water level. The alternator is used to charge a battery carried inboard the sailboat.

3,619,633
THEFT-DETERRENT IGNITION SYSTEM
Delbert L. Brandon, 4813 Beadle, Las Vegas, Nev.
Filed Jan. 19, 1970, Ser. No. 3,865
Int. Cl. H02g 3/00
U.S. Cl. 307—10 **17 Claims**

A theft-deterrent ignition system for automotive vehicles in which the ignition coil and pairs of coding switches are locked in an enclosing box with run and lockout relays, and in which the ignition coil is connected to the distributor through armor covering. The coding switches are interconnected through momentary contact switches which are grouped together in the vehicle to be readily accessible to the driver. The setting of the coding switches determines which of the momentary contact switches must be simultaneously

closed to secure closing of the run relay and energization of the ignition system. Closing of a momentary contact switch



other than a coded one closes the lockout relay and prevents closing of the run relay.

3,619,634

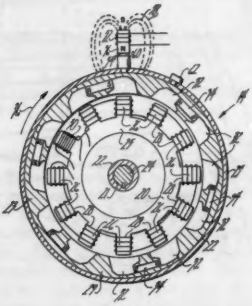
ALTERNATOR AND COMBINED BREAKERLESS IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelan Company Inc., East Longmeadow, Mass.

Continuation of application Ser. No. 834,847, June 19, 1969, now abandoned , Original application Oct. 16, 1967, Ser. No. 675,429. Divided and this application July 10, 1970, Ser. No. 56,182

Int. Cl. F02p *3/06*

U.S. Cl. 307—10 R **9 Claims**



An alternator for use with an internal combustion engine includes a rotor having a plurality of generating magnets and a stator carrying a number of coils in which voltages are induced by the movement of the generating magnets therepast. One of these coils is used to charge the capacitor of an associated capacitor discharge ignition system for the engine, and triggering of the ignition system to control the discharge of the capacitor and firing of the associated spark plug is achieved by a trigger signal producing means including a magnet separate from the generating magnets, a trigger coil, and irregularities such as pins on the rotor for varying the flux of the trigger magnet through the trigger coil in response to rotation of the rotor.

3,619,635

POWER REGULATION SYSTEM

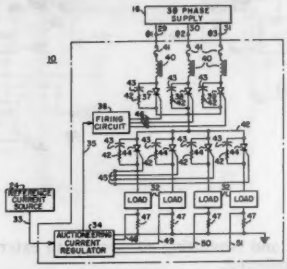
Francis T. Thompson, Murrysville, and Andre Wavre, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1969, Ser. No. 798,912

Int. Cl. H02j *1/00*

U.S. Cl. 307—11 **22 Claims**

A system is disclosed for providing a desired energizing current, according to a reference current signal, to a load or group of load elements. Three-phase energizing current is rectified by a plurality of controlled switching devices such as thyristors, and means are provided for varying the firing angle of the thyristors in accordance with the reference current signal to regulate the resulting output voltage therefrom and thereby regulate the energizing current through the load. Digital transmission means are provided to transmit digital



signals in a high noise level environment. A plurality of error detecting circuits provide alarm signals in the event that the desired current is exceeded, maximum current is called for, or one of the power phases is missing, for more than predetermined time periods. Improved means are also provided for synchronizing asynchronous generators to provide a single three-phase power source.

3,619,636

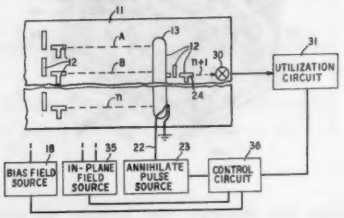
MAGNETIC DOMAIN LOGIC CIRCUIT

Woo Foung Chow, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 1, 1970, Ser. No. 42,333

Int. Cl. G11c *11/14*

U.S. Cl. 307—88 TF **7 Claims**



A multiple input magnetic domain OR circuit is described. The circuit is defined in a sheet of material in which single wall domains can be moved by changing magnetic pole patterns in a magnetically soft overlay. The overlay includes a common element which serves as a terminus for a number of domain shift registers. The element is structured to accept only a single domain for providing an output.

3,619,637

HARMONIC GENERATOR HAVING CASCADED CRYSTALS

Kenya Goto, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 19, 1969, Ser. No. 877,961

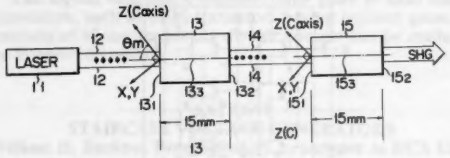
Claims priority, application Japan, Nov. 20, 1968, 43/84520

Int. Cl. H02m *5/16*

U.S. Cl. 307—88.3 **11 Claims**

A harmonic generator comprises at least two nonlinear dielectric crystals of which the planes of incidence and exit are parallel to each other and controlled to match the phase of the electromagnetic waves inciding the plane of incidence prependicularly thereto with the phases of the harmonic wave. These crystals are disposed in cascade such that the

projections of the optical axes of the crystals upon their incidence planes intersect each other at right angles whereby



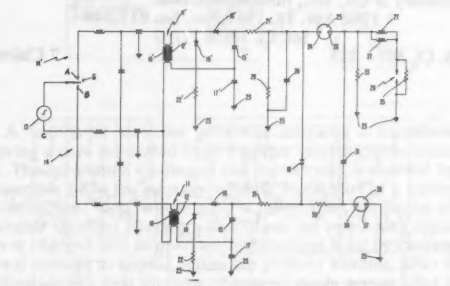
to generate approximately double the output harmonic waves at high efficiency irrespectively of the orientation of the plane of polarization of the incident light ray.

3,619,638

PULSE GENERATING APPARATUS

Earl M. Phinney, Oneonta, N.Y., assignor to The Bendix Corporation

Filed Sept. 25, 1969, Ser. No. 860,890
Int. Cl. H02m *3/18*
U.S. Cl. 307—106 **13 Claims**



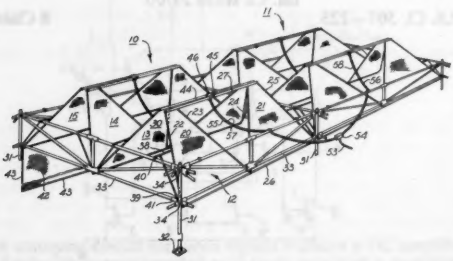
A condenser discharge type electrical pulse generating circuit, such as for a combustion engine ignition system, wherein two storage capacitors are charged in parallel to discharge across a relatively low-voltage trigger gap which connects the condensers in series to discharge across a higher voltage control gap and through a relatively low-voltage ignition gap which is connected in series with the control gap. The above circuit is disclosed herein as being used in combination with a second, alternatively employed ignition circuit which supplies higher energy pulses for short periods, as during the starting of the engine.

3,619,639

ANTENNA ARRAY AND METHOD FOR GENERATING A HIGH INTENSITY ELECTROMATIC PULSE

Jacob J. Gustincic, Los Angeles, Calif., assignor to Radyne, Inc., Chatsworth, Calif.

Filed Mar. 6, 1970, Ser. No. 17,148
Int. Cl. H01q *13/00, 21/00, 21/10*
U.S. Cl. 307—109 **12 Claims**



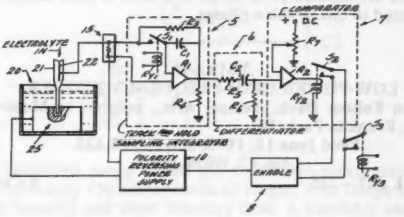
An apparatus and a method for providing a uniform, high intensity, transverse electromagnetic pulse for illuminating a large area, such as a zone 40 meters by 40 meters. An array of horn radiators constructed in modules and fed from parallel transmission lines. A pulse generator including a plurality of high voltage capacitors, a DC supply for charging the capacitors, and a switch for discharging the capacitors into corresponding transmission lines to provide voltage pulses at each horn, with the resulting electromagnetic pulses producing a composite electromagnetic pulse of total voltage many times the voltage of the supply.

3,619,640

STEM OVERCURRENT PROTECTION

Emmet Mitchell Fulkerson, Cincinnati, Ohio, assignor to General Electric Company

Filed June 6, 1968, Ser. No. 734,971
Int. Cl. H02h *3/08*
U.S. Cl. 307—131 **3 Claims**



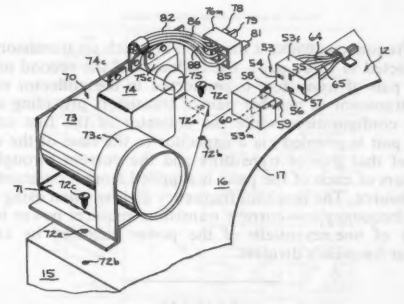
A sensing circuit for use in an electrochemical machining apparatus for prevention of damage to said apparatus caused by a short circuit during the machining process wherein said sensing circuit includes a tracking and comparison circuit.

3,619,641

AUXILIARY STARTER DEVICE FOR AIR CONDITIONER COMPRESSOR

James L. Ballard, Tyler, Tex., assignor to General Electric Company

Filed July 29, 1970, Ser. No. 59,305
Int. Cl. H02j *1/00*
U.S. Cl. 307—149 **4 Claims**



This invention is directed to a factory-assembled device which provides field installation personnel with accurate, quickly installed means for adding extra capacitance to the starting circuit of the electric motor for the fluid compressor of an air conditioner.

3,619,642

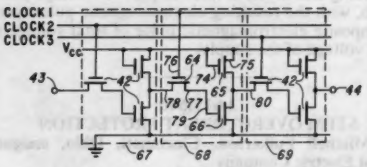
MULTIPHASE BINARY SHIFT REGISTER

Roger S. Dunn, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1969, Ser. No. 875,866
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **8 Claims**

A high stability, binary data, multiphase shift register of at least three phases, stores and shifts "N" bits of binary infor-

mation in approximately $(N \times n)/(n-1)$ binary switches, where n is the number of phases utilized in the register, and N is the maximum number of bits capable of being stored in



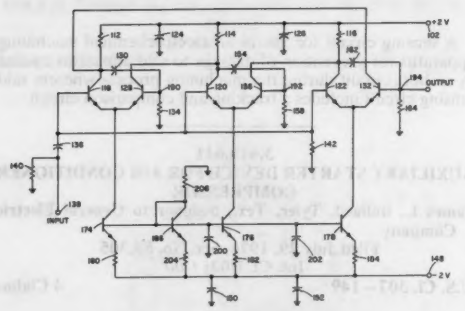
the shift register at all times during its operation. The binary switches are connected in series and each is then selectively connected to one of the n phases.

3,619,643

LOW-POWER HIGH-FREQUENCY DIVIDER

William Folsom Davis, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 11, 1970, Ser. No. 45,433
Int. Cl. H03k *23/08*
U.S. Cl. 307—225 **6 Claims**



A frequency divider is disclosed in which six transistors are connected in three pairs, the collector of the second one of each pair of transistors is connected to the collector of the first transistor of another pair of transistors providing a ring-like configuration, while the collector of the first one of each pair is coupled via a capacitor to the base of the other one of that pair of transistors and the current through the emitters of each of the pairs is supplied from a constant current source. The resultant frequency divider when using good high-frequency low-current transistors requires power in the order of one-seventieth of the power required by known similar frequency dividers.

3,619,644

FREQUENCY DIVIDING CIRCUIT

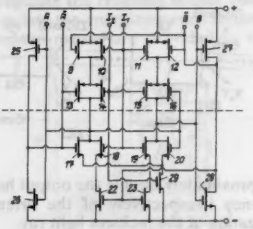
Eric Andre Vittoz, Cernier, Switzerland, assignor to Centre Electronique Horloger SA, Neuchatel, Switzerland

Filed Oct. 14, 1970, Ser. No. 80,696
Claims priority, application Switzerland, Oct. 31, 1969, 16264/69
Int. Cl. H03k *21/06*
U.S. Cl. 307—225 **4 Claims**

A frequency dividing circuit comprises at least one logic structure satisfying the Boolian relationships

$A=BI_1+AI_2$ and $B=BI_1+AI_2$

in which I_1 and I_2 are two complementary input quantities and A and B two output quantities. The logic structure comprises three pairs of field effect transistors each having a source, a drain and a gate, and two outputs each connected to the drains of the two transistors of the first pair and the second pair respectively. The sources of one transistor of the first pair and of one transistor of the second pair are separately connected to the drain of one of the transistors of the third pair, the sources of the two other transistors of the



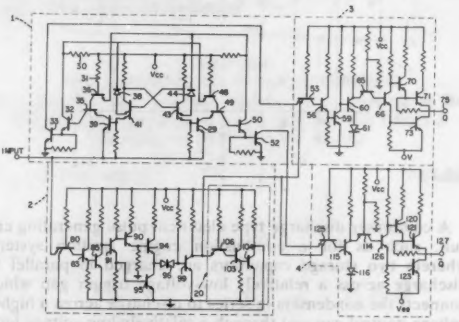
first and second pairs are connected together to the drain of a seventh transistor, and the sources of the two transistors of the third pair and of the seventh transistor are connected to a terminal of a voltage source.

3,619,645

FREQUENCY DIVIDER

Anthony J. Chernoske, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 18, 1969, Ser. No. 817,349
Int. Cl. H03k *21/10*
U.S. Cl. 307—225 **7 Claims**



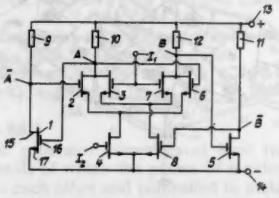
The disclosure is directed to an integratable and programmable frequency divider including a bistable, fixed period generator, a NAND circuit and an AND circuit interconnected so as to provide, among other things, an output of fixed and determinable pulse widths independent of frequency.

3,619,646

FREQUENCY DIVIDER CIRCUIT

Eric Andre Vittoz, Hauterive, Switzerland, assignor to Centre Electronique Horloger SA, Neuchatel, Switzerland

Filed Nov. 12, 1969, Ser. No. 875,680
Claims priority, application Switzerland, Nov. 11, 1968, 16,822/68
Int. Cl. H03k *21/00*
U.S. Cl. 307—225 **8 Claims**



A frequency divider circuit including at least one logical structure complying with the Boole Relations:

$A=BI_1+AI_2$ and $B=BI_1+AI_2$

in which I_1 and I_2 are two complementary input quantities and A and B two output quantities.

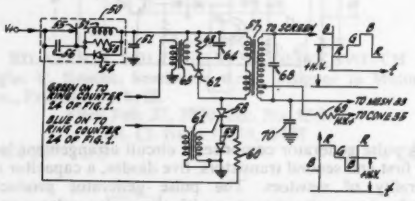
The logical structure comprises three pairs of field effect transistors, such as MOS-transistors having isolated gates. A cascade of binary frequency divider circuits can be made as an integrated circuit.

3,619,647

STAIRCASE VOLTAGE GENERATORS

William H. Barkow, Pennsauken, N.J., assignor to RCA Corporation

Filed Sept. 20, 1968, Ser. No. 761,199
Int. Cl. H03k *3/35, 4/02*
U.S. Cl. 307—227 **11 Claims**



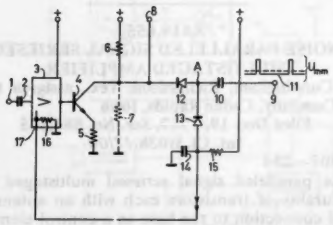
A multilever staircase generator employs a transformer having a core fabricated from a square loop magnetic material. The secondary winding of the transformer is shunted by a capacitor while the primary winding forms part of a controllable current loop, whose path is selected by activation of a suitable thyristor. During a first mode the secondary capacitor is charged to a stepped up, high-voltage level by causing a lower voltage to appear across the primary winding, after the activation of a first thyristor. A second mode occurs after the secondary capacitor transfers sufficient energy to saturate the secondary winding inductance and cause core switching; at which time the capacitor is charged to an opposite polarity. A third mode is provided by activating a second thyristor, which causes the secondary capacitor to transfer the energy stored thereby to a reactive impedance element located in the primary winding and switched into a suitable path by said thyristor activation.

3,619,648

CIRCUIT ARRANGEMENT FOR RESTORING THE DIRECT-CURRENT COMPONENT BY THE CONTROL OF A REFERENCE VALUE

Jorg Wolber, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,764
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **4 Claims**



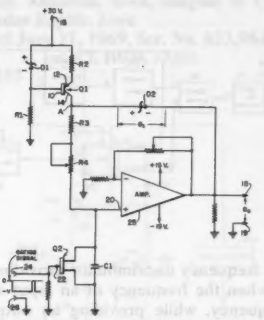
A clamping circuit for video signals features a DC amplifier having an output coupled to a diode to which a sampling signal is applied. Another diode is coupled to the first diode and to a control input of the amplifier to maintain constant clamping.

3,619,649

SLOW-SPEED BOOTSTRAP SWEEP CIRCUIT

Melvin R. Hoffman, New York, N.Y., assignor to The Western Union Telegraph Company, New York, N.Y.

Filed May 26, 1969, Ser. No. 827,802
Int. Cl. H03k *4/24*
U.S. Cl. 307—228 **7 Claims**



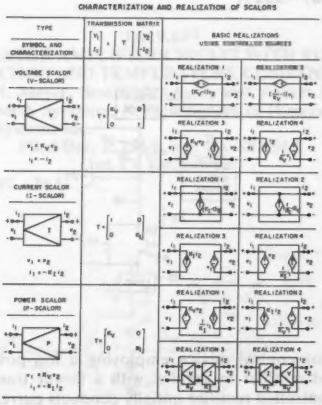
A bootstrap sweep circuit generates slow-speed sweeps of approximately 150 milliseconds or longer, with ramps having good linearity and short recovery time. A transistor and two zener diodes are employed to generate a stable sweep voltage during the sweep cycle regardless of temperature variations. A square top gating pulse spaces the successive linear ramps which are sharply saw-toothed.

3,619,650

LINEAR ACTIVE TWO-PORT NETWORK FOR EXPANDING OR COMPRESSING CHARACTERISTIC CURVE OF TWO-TERMINAL DEVICE

Leon O. Chua, West Lafayette, Ind., assignor to Purdue Research Foundation

Filed May 27, 1968, Ser. No. 732,185
Int. Cl. G06g *7/12*
U.S. Cl. 307—230 **12 Claims**

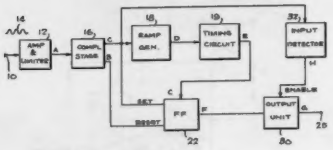


A linear active two-port network element for synthesizing nonlinear network components with arbitrarily prescribed characteristics. The elements, by themselves or in combination, can be utilized for a variety of applications, and are particularly useful in integrated circuit technology. The element included herein is the Scalor. The Scalor expands or compresses the characteristic curve of any two-terminal device along a predetermined axis or axes without altering the shape of the curve.

3,619,651
DIGITAL FREQUENCY DISCRIMINATOR

Richard A. Aldrich, Sunnyvale, Calif., assignor to Anderson Jacobson, Inc., Mountain View, Calif.

Filed Nov. 7, 1969, Ser. No. 874,763
Int. Cl. H03k 5/20
U.S. Cl. 307—233 10 Claims

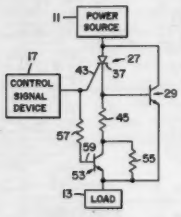


A digital frequency discriminator providing an output of a first level when the frequency of an input signal is above a known frequency, while providing an output of a second level when the input signal frequency is below the known frequency. The discriminator provides two complementary square waves with frequencies corresponding to the input signal frequencies. The two square waves are supplied to set and reset a flip-flop which is clocked by clock pulses, produced by a timing circuit, which is activated by a ramp voltage generator. The latter controls the timing circuit to provide each clock pulse a fixed period after the start of each input signal cycle, the period being equal to one-half the period of one cycle at the known frequency. Added circuitry may be included to control the digital output to be provided only if the input signal is of not less than a minimum frequency.

3,619,652
MOTOR CONTROL DEVICE

Hugh M. Ogle, Palo Alto, Calif., assignor to Integrated Motorcontrol, Inc.

Filed Mar. 10, 1969, Ser. No. 805,665
Int. Cl. H03k 17/04, 17/10, 17/72
U.S. Cl. 307—252 N 1 Claim

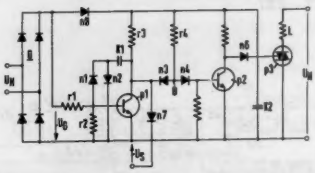


A motor control device employing a low-power silicon-controlled rectifier in parallel with a power transistor. The silicon-controlled rectifier initially conducts current from the power source to the load and then triggers the power transistor so that they together conduct the power to the load with the power transistor handling most of the current. The power transistor is turned on by the voltage across a resistor, on a capacitive or inductive reactance element in series with a silicon-controlled rectifier. In another embodiment a diode is used in series with the base of the power transistor and an external pulse is used to back bias the diode to turn off the circuit. In a further embodiment a low-power transistor is used in series with the silicon-controlled rectifier wherein the circuit is turned off by turning off the low-power transistor.

3,619,653
PULSE GENERATOR FOR PRODUCING A SYNCHRONOUS PULSE SEQUENCE WITH ALTERNATING VOLTAGE OF ADJUSTABLE PHASE ANGLE

Herbert Poppinger, and Manfred Liska, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 29, 1969, Ser. No. 845,722
Claims priority, application Germany, Aug. 1, 1968, P 17 63 751.3
Int. Cl. H03k 17/00
U.S. Cl. 307—252 B 8 Claims

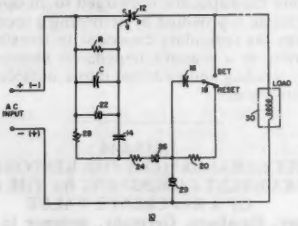


A pulse generator comprises a circuit arrangement including first and second transistors, five diodes, a capacitor and a plurality of resistors. The pulse generator produces a synchronous pulse sequence with alternating voltage and adjustable phase angle and drives a Triac. The Triac is connected through a load to a source of alternating voltage.

3,619,654
CONTROLLED AC PULSE CIRCUIT

Edward W. Nichols, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1969, Ser. No. 848,658
Int. Cl. H03k 17/72
U.S. Cl. 307—252 UA 7 Claims



The invention is an AC switching circuit comprising a potential source, a controlled conduction means having a control electrode and a control bias circuit for gating the controlled conduction means to a conductive state during a single half cycle of the AC potential.

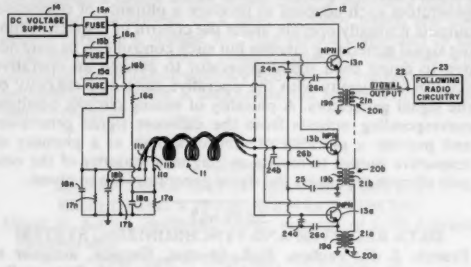
3,619,655
NOISE PARALLELED SIGNAL SERIESED MULTISTAGED AMPLIFIER

Paul M. Cunningham, Richardson, Tex., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Dec. 19, 1969, Ser. No. 886,505
Int. Cl. H03k 17/00
U.S. Cl. 307—254 7 Claims

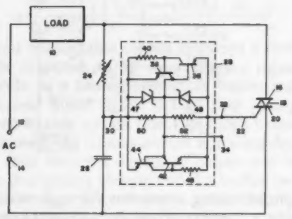
A noise paralleled signal seriesed multistaged amplifier with a plurality of transistors each with an antenna sensed AC signal connection to the base as a control element input and with this including a DC bias connection through an individual antenna wire conductor and with these antenna wires insulated mutually from each other. Each transistor includes a collector connection to a voltage supply, and an emitter follower connection through an individual transformer primary coil to ground. The transformer secondary coils are connected in series in a signal output circuit to, in

combination, provide the desired device noise paralleled and signal seriesed result for an optimized system signal to noise



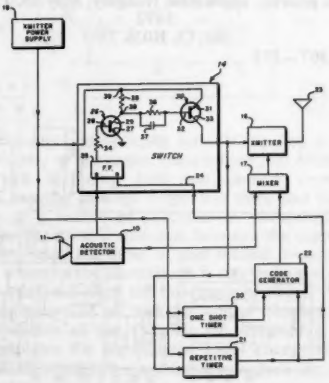
ratio in the output from an H-vector loop VLF-LF antenna to amplifier system.

3,619,656
BILATERAL VOLTAGE RESPONSIVE SWITCH
Douglas C. Domke, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Feb. 27, 1970, Ser. No. 15,050
Int. Cl. H03r *17/56*; **G05f**
U.S. Cl. 307—255 **4 Claims**



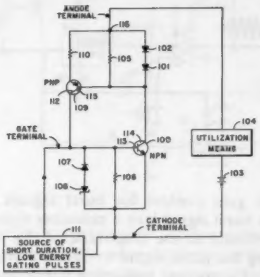
An improvement is disclosed for a known bilateral voltage responsive switch comprising a pair of high resistors connected across the voltage responsive terminals thereof.

3,619,657
POWER CONTROL SWITCH
Henry Naubereit, Brown's Mill, N.J., assignor to The United States of America as represented by the Secretary of the Navy
Division of Ser. No. 710,702, Feb. 27, 1968.
Filed Apr. 2, 1969, Ser. No. 812,936
Int. Cl. H03k *17/00*
U.S. Cl. 307—255 **1 Claim**



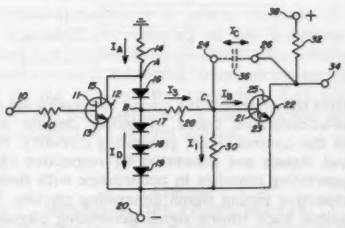
A switching network inhibiting the flow of current from a power supply to a load until the receipt of an actuating signal at the set terminal of a flip-flop within the switching network. The flow of current continues until the actuating signal is removed, an inhibiting signal is received at the reset terminal of the flip-flop and a predetermined fixed period of time has lapsed after receipt of the inhibiting signal.

3,619,658
GATE CONTROLLED SWITCH EMPLOYING TRANSISTORS
Ralph A. Prunty, Anamosa, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed June 17, 1969, Ser. No. 833,984
Int. Cl. H03k *17/00*
U.S. Cl. 307—255 **2 Claims**



A power transistor is connected in series with diode means, DC source means, and utilization means, with the diode means having its forward impedance presented to current flow through the transistor. A control transistor is connected in series with a current limiting resistor, said DC source and said utilization means. The collector of each transistor is connected to the base of the other to form a feedback loop. Said diode means is connected to provide a constant voltage across the series arrangement of the resistor and the emitter-base electrode circuit of the control transistor, thereby limiting the current through the control transistor. A pulse of proper polarity applied to the collector of the control transistor will divert the collector current thereof from the base of the power transistor, thereby interrupting the feedback loop and turning off the circuit. A pulse of opposite polarity will turn on the circuit.

3,619,659
INTEGRATOR AMPLIFIER CIRCUIT WITH VOLTAGE REGULATION AND TEMPERATURE COMPENSATION
Bernard H. Meyer, Scottsdale, Ariz., and Robert R. Greenwood, North Syracuse, N.Y., assignors to Honeywell Information Systems Inc.
Filed Dec. 2, 1969, Ser. No. 881,562
Int. Cl. H03k *5/12*
U.S. Cl. 307—263 **4 Claims**



An integrator amplifier circuit for producing signal pulses of a trapezoidal shape having leading and trailing edges with constant rise and fall slopes during variations in operating potentials supplied to the circuit and equal rise and fall slopes during ambient temperature variations. The circuit is suitable for fabrication by integrated circuit technology and

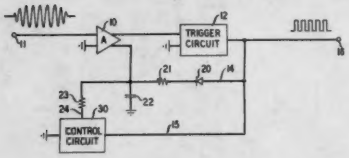
for use in a bipolar transmitter which derives bipolar signals from monopolar signals. Controlled input current flow from a switched voltage regulator and a component configuration designed to balance ambient temperature effects provide for constant and equal rise and fall times, respectively.

3,619,660

AUTOMATIC GAIN CONTROL UTILIZING CONTROLLED SAMPLING

John James Rugo, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 14, 1970, Ser. No. 28,441
Int. Cl. H03k 1/14; H03g 3/30, 3/20
U.S. Cl. 307—264 **9 Claims**



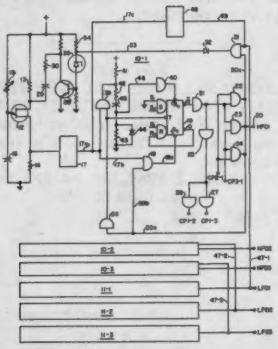
Automatic gain control for burst signals is achieved by converting a burst signal into a pulsating signal having a duty cycle proportional to the amplitude of the burst signal, and by integrating the pulse signal to obtain a direct current control voltage. To prevent unwanted variations in the control voltage during no-signal intervals, adjustment of the control voltage amplitude takes place on a cycle-by-cycle basis of the burst signal by providing a discharge path for the integrator circuit for a predetermined interval only after each pulse of the pulsating signal.

3,619,661

MULTICHANNEL CONTROL CIRCUIT

Luther C. Butler, Jr., Garden Grove, Calif.; Thomas W. Grasmehr, Costa Mesa, Calif., and Robert S. Jamieson, assignors to Lorain Products Corporation, Lorain, Ohio

Filed Feb. 5, 1970, Ser. No. 8,877
Int. Cl. H03h 17/26
U.S. Cl. 307—269 **16 Claims**



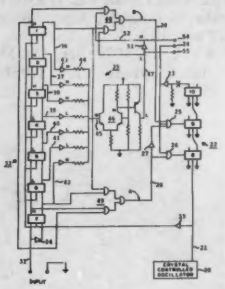
A control signal generating circuit for producing a plurality of phase-coordinated trains of pulses despite any single failure in the control signal generating circuitry. A plurality of control signals are generated by respective channels of signal generating circuitry in accordance with timing signals from respective timing signal generating circuits. Delay circuitry within each timing signal generating circuit prevents any one of such generating circuits from producing a timing signal until a majority of the timing signal generating circuits are ready to produce their respective timing signals, at which time simultaneous timing signals are caused to appear at the outputs of all timing signal generating circuits. Synchronizing circuitry within each timing signal generating circuit causes the latter to assume an operative state in conformity with the operative states of the majority of the timing signal generating circuits, this conforming activity occurring simultaneously in all timing signal generating circuits when the latter produce their respective timing signals. A plurality of signal generators each adapted to produce a plurality of respective outputs normally operate under the control of respective timing signal generating circuits but such control can be overridden to cause each signal generator to assume an operative state in conformity with the operative state of a majority of the signal generators. A plurality of mixing circuits combine corresponding outputs from the different signal generators and provide a plurality of control signals at a plurality of respective output terminals as long as a majority of the outputs of each type from the signal generators are in phase.

3,619,662

DATA RECEIVER AND SYNCHRONIZING SYSTEM

Francis J. E. Vachon, Hull, Quebec, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 23, 1970, Ser. No. 91,650
Int. Cl. H03l 17/00
U.S. Cl. 307—269 **7 Claims**



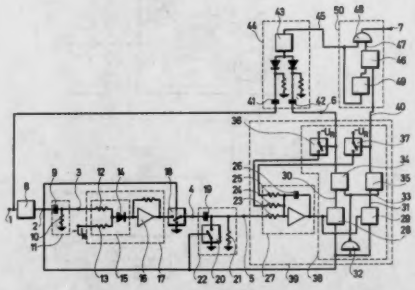
Pulse synchronizing apparatus for non-return-to-zero data signals using a counter driven by a crystal controlled oscillator. The counter output is phase-locked to incoming data signals by enabling various feedback gates to alter the total count. The data signal is sampled and stored in a shift register. A logic circuit determines the binary number represented by the majority of the samples. A comparator responsive to the first and last samples and a comparator responsive to the first sample and the majority sample value determine which counter gates should be enabled to achieve synchronization.

3,619,663

LINEARITY ERROR COMPENSATION CIRCUIT

Kalman Molnar, Budapest, Hungary, assignor to Merestechnikai Kozponti Kutato Laboratorium, Budapest V, Hungary

Filed May 15, 1970, Ser. No. 37,807
Claims priority, application Hungary, May 15, 1969, ME 1072
Int. Cl. H03k 1/10
U.S. Cl. 307—271 **9 Claims**



The linearity error compensation circuit for a meter converter includes a monostable multivibrator for receiving an

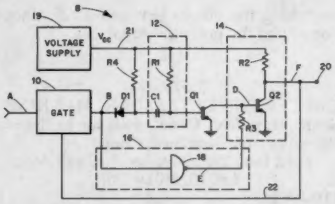
output frequency signal from the meter converter which varies in response to a function being metered. The multivibrator controls a switch which passes either a reference input to a function transformer or a level regulator which are connected between a voltage blocking circuit connected to the multivibrator output and a voltage-frequency converter. The output of the voltage-frequency converter is connected to an arithmetic unit which is also connected to the output of the meter converter.

3,619,664

MONOSTABLE MULTIVIBRATOR CIRCUIT EMPLOYING A FEED FORWARD CIRCUIT

Albert H. Ashley, Holliston, Mass., assignor to GTE Sylvania Incorporated

Filed Nov. 4, 1969, Ser. No. 873,797
Int. Cl. H03k *3/284*
U.S. Cl. 307—273 11 Claims



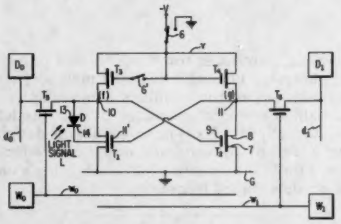
An improved monostable circuit employs a first gating circuit which, in response to an input trigger signal, activates the timing cycle of a timing circuit. A buffer output circuit supplies a second input signal to the first gating circuit to render the monostable circuit nonresponsive to another input trigger circuit until the timing circuit has completed the timing cycle. A feed forward circuit is connected between the output of the first gating circuit and the buffer output circuit to prevent false triggering of the monostable circuit due to noise signals on the circuit power supplies.

3,619,665

OPTICALLY SETTABLE FLIP-FLOP

Walter Frank Kosonocky, Skillman, N.J., assignor to R.C.A. Corporation

Filed Oct. 15, 1969, Ser. No. 866,565
Int. Cl. H03k *3/26*
U.S. Cl. 307—279 5 Claims



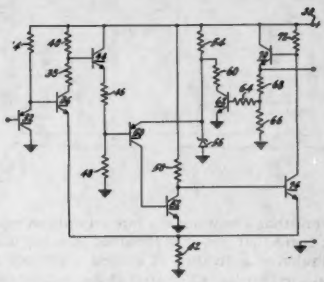
An electrically and optically settable flip-flop is disclosed which includes, in integrated circuit form, an MOS flip-flop memory cell including first and second cross-coupled transistors coupled through respective third and fourth load transistors to a source of potential. A photodiode is connected from the cross connection between the output of said first transistor and the input of said second transistor to the substrate, whereby the photodiode is charged substantially to the source potential when the flip-flop is in its reset state with the first transistor cut off and the second transistor conductive. Interruption of the coupling of potential to the first transistor isolates the photodiode. Light energy directed to the photodiode renders it conductive to reduce the voltage at the input of the second transistor until its output turns on the first transistor, whereby the flip-flop is set. Restoring the coupling of bias potential to the first transistor causes the existing electrical state of the flip-flop to be maintained.

3,619,666

TRIGGER CIRCUITS HAVING UNIFORM TRIGGERING VOLTAGES

Adel Abdel Aziz Ahmed, Somerville, and Mark Berwyn Knight, North Caldwell, both of N.J., assignors to RCA Corporation

Filed May 16, 1969, Ser. No. 825,193
Int. Cl. H03k *3/15*
U.S. Cl. 307—290 8 Claims



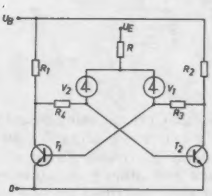
A trigger circuit is disclosed of a type which can be constructed using integrated, semiconductor chip technology and which includes a thresholding circuit arranged to fix the triggering voltages thereof, whereby a large number of trigger circuits having uniform triggering voltages from chip-to-chip may be produced.

3,619,667

BISTABLE MULTIVIBRATOR

Albrecht Gerlach, Emmendingen, Germany, assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 30, 1970, Ser. No. 23,644
Claims priority, application Germany, Apr. 17, 1969, P 19 19 540.5
Int. Cl. H03k *3/26*
U.S. Cl. 307—291 3 Claims



A bistable multivibrator in which the base of first and second transistors are coupled to the collectors of said second and first transistors respectively. One terminal of first and second elements exhibiting thyratron characteristics are coupled to the base of the respective first and second transistors. The other terminal of said first and second elements are coupled to a control voltage.

3,619,668

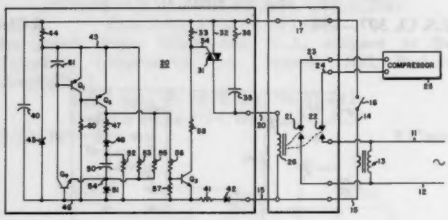
MINIMUM OFF-TIME CIRCUIT

Balthasar H. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1970, Ser. No. 67,445
Int. Cl. H03k *17/26, 17/28*
U.S. Cl. 307—293 8 Claims

An alternating current contactor or relay which can be used for control of equipment such as refrigeration compressors is disclosed with a minimum off-time control. The minimum off-time control includes a resistor-capacitor tim-

ing circuit which charges initially from a power source through a transistor, and this is held in a charged condition while the current continues to flow through the transistor to energize a solid-state switch which energizes the contactor.



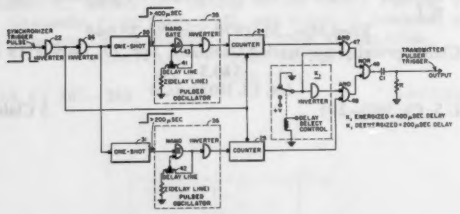
In the event that a momentary interruption of power occurs, or in the event that power is removed, the capacitor starts to slowly discharge activating a second transistor circuit that shorts out the first transistor so that the output switch cannot be reenergized for some minimum period of time.

3,619,669

PULSED DIGITAL DELAY

Richard D. Wheeler, Norco, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 20, 1970, Ser. No. 39,953
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **4 Claims**



A pulsed digital delay circuit using a pair of pulsed oscillators for generating extremely accurate, jitter free, continuously adjustable delay for pulse-timing circuits, and which can be synchronized with other system-timing pulses.

The invention herein described may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

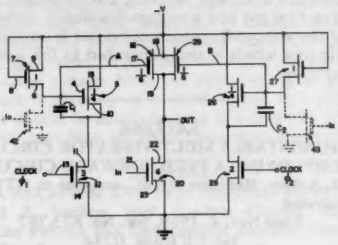
3,619,670

ELIMINATION OF HIGH VALUED "P" RESISTORS FROM MOS LSI CIRCUITS

Gary L. Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed Nov. 13, 1969, Ser. No. 876,513
Int. Cl. H03k *3/26*
U.S. Cl. 307—304 **8 Claims**

The circuit of the invention is capable of maintaining a static output, the level of which is at least as great as the circuit's potential supply. The circuit is comprised of complementary transistorized bootstrap circuits each of which uses a storage capacitor between the output of the transistorized bootstrap circuit and the gate of the output transistor of the bootstrap circuit, to temporarily maintain the output from each bootstrap circuit at the potential supply. Clocking means are provided to overlap the outputs from each bootstrap circuit so as to maintain the component's output at the level of the potential supply. Gating means are provided for



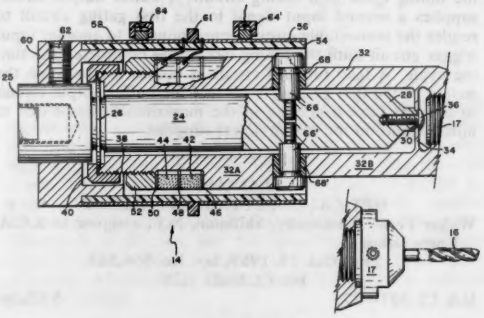
logically switching the output between a reference potential such as ground and the potential supply.

3,619,671

TRANSDUCER FOR ULTRASONIC MACHINE TOOL

Andrew Shoh, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Dec. 29, 1969, Ser. No. 888,468
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.2 **16 Claims**



An ultrasonic transducer for machine tool purposes comprises two elongated coaxially disposed members coupled to each other with one of the members being adapted to oscillate as a half-wavelength resonator at the predetermined frequency, typically 20 kHz. The transducer is designed to be coupled to a drill of conventional design and when so coupled causes a tool bit to rotate while undergoing axial oscillation at the predetermined frequency.

3,619,672

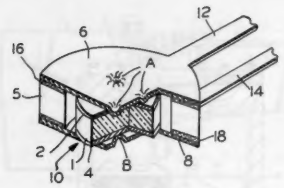
PIEZOELECTRIC CERAMIC RESONATOR AND MOUNTING

Takashi Nagata, Ikeda; Michio Ishibashi, Sulta, and Yasuo Nakajima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Continuation of application Ser. No. 711,292, Mar. 7, 1968, now abandoned. This application Sept. 11, 1970, Ser. No. 71,367
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.4 **5 Claims**

A ceramic resonator and mounting comprising a ceramic resonator having electrodes on both flat major opposite surfaces thereof, and a pair of cover plates of elasto-conductive material, each of which has an electric terminal and at least one contact means. Said resonator is supported between said contact means of said pair of cover members so as to be sub-

jected to contact pressure by said contact means. An insulating spacer surrounds the periphery of said resonator and



securely joins said pair of cover members to each other so as to form a housing around said resonator.

3,619,673

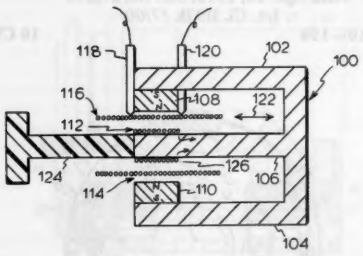
MOVING COIL LINEAR MOTOR

Clifford J. Helms, Calabasas Park, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Continuation-in-part of application Ser. No. 704,291, Feb. 9, 1968, now Patent No. 3,505,599. This application Apr. 7, 1970, Ser. No. 26,330

Int. Cl. H02k *41/02*

U.S. Cl. 310—13 **5 Claims**



A linear motor capable of providing a reasonably long stroke and rapid acceleration. The motor is comprised of a core structure defining an airgap around a central leg. Means are provided for developing a substantially uniform magnetic field through the gap. A substantially rigid drive coil structure is concentrically disposed around the central leg with the turns thereof threading the gap. The coil is mounted for reciprocal movement along the central leg in response to a propelling force developed on the coil by driving a current therethrough. In order to minimize inductance, a bucking coil is also wound around the central leg and connected in series opposition to the movable drive coil.

3,619,674

ROTATING ELECTRIC MACHINE WITH DIRECTLY LIQUID-COOLED STATOR WINDING

Bror Dalmo; John Franked; Hans Landhult, and Birger Nordberg, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

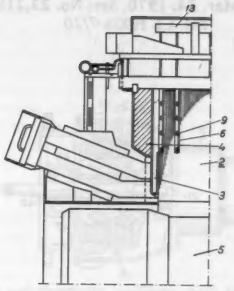
Filed Oct. 23, 1969, Ser. No. 868,741

Claims priority, application Sweden, Oct. 28, 1968, 14526/68

Int. Cl. H02k *9/00*

U.S. Cl. 310—54 **7 Claims**

A stator core with a directly liquid-cooled stator winding has a plurality of slits axially spaced along it perpendicular to the axis. Each slit contains a plurality of cooling blocks arranged together to extend around the periphery of the core. A substantially annular cooling tube is arranged in grooves in



the blocks extending substantially tangentially, and is clamped in these grooves.

3,619,675

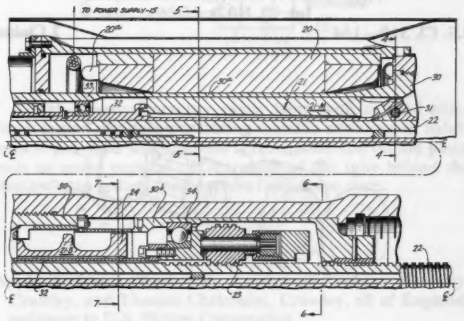
CONTROL ROD DRIVE MECHANISM

Silveus M. Baker, Tustin, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed June 16, 1969, Ser. No. 833,377

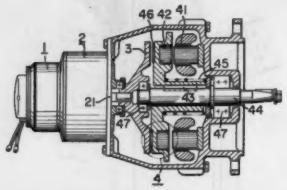
Int. Cl. H02k *7/12*

U.S. Cl. 310—80 **7 Claims**



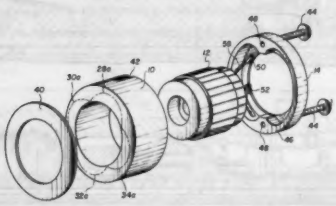
A control rod drive mechanism for positioning a control rod in a nuclear reactor. The control rod having a part length poison portion for positioning in the reactor core. The mechanism coacting with a pressure housing and including an energizable stator mounted on the outside of the pressure housing and a rotor responsive to the stator mounted on the inside of the pressure housing for positioning a control rod. A rotor tube is movably mounted with a translating leadscrew and positioned within the rotor to be rotatably responsive to the magnetic field coupled thereto from the stator. The part length control rod is connected to the leadscrew and movable therewith. The rotor carries a nut assembly for engagement with the leadscrew to cause the leadscrew to be responsive to the rotations of the rotor and thereby the positioning of the control rod. The rotor is constructed of two pivoted segments adapted to pivot in opposite directions in response to the energization and deenergization of the stator for providing an unlocking and locking action of the rotor by moving one of the segments against the pressure housing to effect the braking action of the rotor and effective for preventing translation of the leadscrew.

3,619,676
DUPLEX SERVOMOTOR
Hiroshi Kawakami, and Juichi Tatsumi, both of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Yahata-ku, Kitakyushu-shi, Fukuoka-ken, Japan
Filed Mar. 24, 1970, Ser. No. 22,215
Int. Cl. H02k 7/20
U.S. Cl. 310—112 6 Claims



A duplex servomotor suitable for use in machine tools requiring automatic position control, feed control and the like, and other applications, which comprises a constant speed AC motor adapted to be coupled with a load to drive said load and a low-inertia DC servomotor adapted to be coupled with said load through speed reduction means and clutch means. The AC motor and DC motor are combined and arranged as a compact unit in a machine frame so that high-speed operation and low-speed operation can be independently transmitted to the load according to requirement.

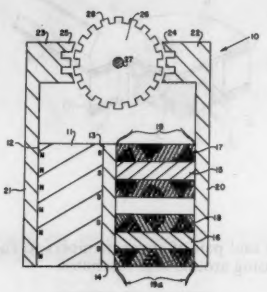
3,619,677
TORQUER WITH MULTIPOLE PERMANENT MAGNET PRODUCED FROM A METAL RING
William Hargreaves, Jenkintown, Pa., assignor to Singer-General Precision, Inc., Little Falls, N.J.
Filed Mar. 19, 1969, Ser. No. 808,485
Int. Cl. H02k 21/26
U.S. Cl. 310—154 2 Claims



A torquer includes a cylindrical stator, a cylindrical rotor designed to rotate within the stator and a brush block ring assembly disposed over the rotor and alongside the stator, the stator is made by first magnetizing the stator with a magnetizing fixture so as to form poles in the stator solely by using the fixture. Usually four poles are so formed but more can also be formed. A ring-shaped keeper is mounted alongside the stator on the side opposite the brush block assembly side of the stator. The stator and the other components can then be shipped unassembled in this manner with the keeper alongside the stator. When assembled, the keeper is removed and the stator retains its magnetism.

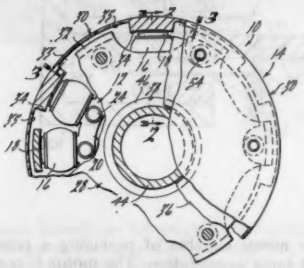
3,619,678
DUAL OUTPUT AC TRANSDUCER
Edgar J. Ruof, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 22, 1970, Ser. No. 4,934
Int. Cl. H02k 21/38
U.S. Cl. 310—155 4 Claims

The transducer includes a permanent magnet with opposite poles on a pair of opposite face surfaces thereof, a pair of inductive coil assemblies operatively positioned with corresponding ends thereof adjacent one of the magnet poles, a rotatable magnetic disc with a plurality of uniformly spaced teeth thereon, and elongate pole pieces operatively engaging the remaining pole of the magnet and the other ends of the coil assemblies. The pole pieces are positioned in opposed



relation with the magnetic disc therebetween and have uniform, circumferentially equally spaced teeth thereon corresponding to teeth on the magnetic disc to induce electrical pulses in the coil assemblies with rotation of the magnetic disc.

3,619,679
GENERATOR STRUCTURE
Thomas F. Carmichael, Drayton Plains, Miss., assignor to Syncro Corporation, Oxford, Mich.
Filed Apr. 10, 1970, Ser. No. 27,270
Int. Cl. H02k 17/00
U.S. Cl. 310—159 10 Claims

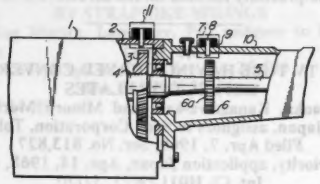


A generator having a pair of armature bodies with interdigitating fingers on each of the armature bodies defining magnetic poles of opposite polarity with one of the armature bodies being a preexisting rotary member such as a flywheel and with the other armature body being a separate fabricated member nested in the one member and with the fingers of each extending in the same axial direction.

3,619,680
DEVICE FOR DETECTING THE WHEEL SPEED OF AN AUTOMOBILE
Atutoshi Okamoto, Toyohashi, Japan, assignor to Nippondenso Kabushiki Kaisha Kariya-shi, Aichi-ken, Japan
Filed Feb. 26, 1970, Ser. No. 14,564
Claims priority, application Japan, Mar. 26, 1969, 44/26910
Int. Cl. H02k 19/24
U.S. Cl. 310—168 3 Claims

A device for detecting the wheel speed of an automobile including a rotary disc of magnetic material having projections in the periphery thereof and attached to a transmission shaft in combination with a pulse signal generator having a

magnet and a coil wound around the magnet. The pulse signal generator is mounted on the housing of an extension



adjacent the rotary disc so that the rotation of the rotary disc produces a high-voltage level pulse signal proportional in number to the wheel speed.

3,619,681

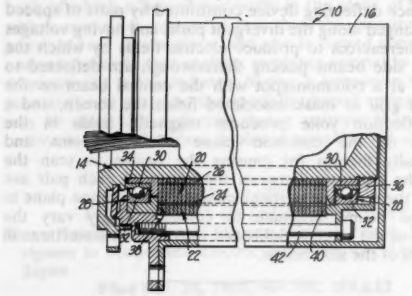
ROTARY SEAL AND ROTARY ELECTRICAL COUPLING EMBODYING SAME

Frank Ginkel, and Ernst Richard Ginkel, both of 502 West Comstock Ave., Glendora, Calif.

Filed June 1, 1970, Ser. No. 41,794

Int. Cl. H01r *39/08*

U.S. Cl. 310—232 **12 Claims**



A rotary seal assembly having relatively rotatable inner and outer members and a number of sheet thin, laterally resilient, radially inner and outer sealing discs surrounding the inner member within an annular clearance space between the members. The inner and outer discs are secured and sealed to the inner and outer members, respectively, and have radially overlapping circumferential portions which bear yieldably against one another to form a fluid seal between the members. A viscous slipring construction embodying the rotary seal assembly.

3,619,682

ARC DISCHARGE LAMP INCLUDING MEANS FOR COOLING ENVELOPE SURROUNDING AN ARC TUBE

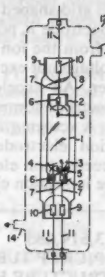
John M. Lo, Newton; Warren Calvin Gungle, Danvers, and John F. Waymouth, Marblehead, all of Mass., assignors to Sylvania Electric Products Inc.

Filed Apr. 1, 1969, Ser. No. 811,990

Int. Cl. H01j *61/18, 61/52*

U.S. Cl. 313—22 **10 Claims**

The arc tube of an arc discharge device is closely surrounded by, but spaced from, an optically transmissive envelope. The space between the tube and the envelope is filled with a transparent, inert, heat-transfer fluid. Forced cooling of the exterior envelope wall permits the arc tube to be



operated at a substantially uniform wall temperature, at a high efficiency and high-wall loading.

3,619,683

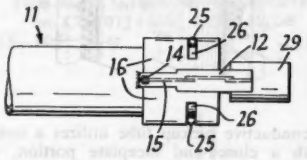
ARC TUBES

Robert Frederick Weston, and Kenneth Frederick Furmidge, both of London, England, assignors to British Lighting Industries Limited, London, England

Filed May 23, 1969, Ser. No. 827,287

Int. Cl. H01j *61/52*

U.S. Cl. 313—47 **3 Claims**



A high-pressure mercury vapor lamp with a fused silica pinch sealed arc tube containing metallic additions in halide form is provided with ceramic screens mounted on the pinch seals to cover parts of the envelope of the tube behind the electrodes to reduce the heat loss from these parts.

3,619,684

ION SOURCE

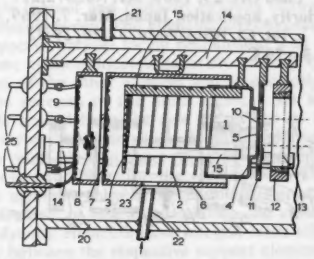
Derek Andrew, Charlwood; Lawrence Graham Pittaway, Crawley, and Thomas Chrisholm, Crawley, all of England, assignors to U.S. Philips Corporation

Filed Apr. 23, 1970, Ser. No. 31,147

Claims priority, application Great Britain, Apr. 28, 1969, 21453-69

Int. Cl. H05h *1/00*

U.S. Cl. 313—63 **4 Claims**



A nonmagnetic, electron impact ion source comprising an evacuated envelope having means for passing ionizing gases

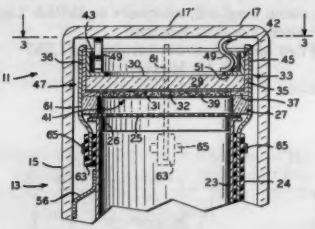
through the envelope. Within the envelope, an electron emitting cathode is positioned adjacent a grid-shaped ionization chamber. A conducting wall section of the ionization chamber that is impenetrable to ions has an ion exiting aperture, which is adjacent to a grid-shaped electrode for extracting ions. The extracting electrode is positioned at a distance of a few tenths of a mm. from the ion exiting aperture, and kept at a small negative voltage not exceeding 5 volts relative to the ionization chamber. An acceleration electrode adjacent to the extracting electrode forms ions from the ionization chamber into beams. A screen grid placed between the extracting and acceleration electrodes prevents the high negative voltage of the acceleration electrode from affecting the electric field within the ionization chamber.

3,619,685

PHOTOCONDUCTIVE PICKUP TUBE WITH UNITIZED ELECTRODE STRUCTURE HAVING THE PHOTOCONDUCTIVE TARGET ELECTRODE SPACED FROM THE TUBE FACEPLATE

John J. Miller, Seneca Falls, and Carl W. Penird, Waterloo, both of N.Y.

Filed Feb. 16, 1970, Ser. No. 11,616
Int. Cl. H01j *1/18, 1/92, 19/46, 31/26*
U.S. Cl. 313—65 A **9 Claims**



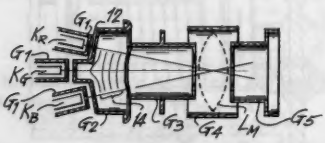
A photoconductive pickup tube utilizes a one-piece envelope, with a closed-end faceplate portion, wherein a unitized mount structure is positioned. The integrated mount includes a beam forming portion with a mesh electrode oriented relative to the frontal end thereof. The unitized array continues whereof a target substrate, having a photoconductive target electrode formed thereon, is insulatively spaced from the mesh electrode. Resilient means are terminally employed to space the target substrate from the interior surface of the envelope faceplate, and a connective means for the target electrode is extended in an insulated manner along the mount to emerge from the base portion of the envelope.

3,619,686

COLOR CATHODE-RAY TUBE WITH IN-LINE PLURAL ELECTRON SOURCES AND CENTRAL SECTION OF COMMON GRID PROTRUDING TOWARD CENTRAL SOURCE

Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,211
Claims priority, application Japan, Mar. 7, 1969, 44/17321
Int. Cl. H01j *29/50, 31/20, 29/32*
U.S. Cl. 313—70 C **3 Claims**



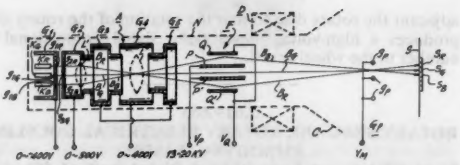
In a cathode-ray tube of the single-gun, plural-beam type in which the plurality of beams are made to intersect each other substantially at the optical center of a main focusing lens, a beam-generating assembly is provided in which the respective beams are generated at suitable distances from the main focusing lens to correct for any disparity in the focusing effects imparted to the respective beams by the main focusing lens and any auxiliary lens and thereby to cause the beams to be precisely focused on the screen.

3,619,687

COLOR TV TUBE HAVING CURVED CONVERGENCE DEFLECTION PLATES

Senri Miyaoka, Kanagawa-ken, and Minoru Morio, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 7, 1969, Ser. No. 813,827
Claims priority, application Japan, Apr. 14, 1968, 43/24592
Int. Cl. H01j *29/72, 31/20*
U.S. Cl. 313—78 **4 Claims**



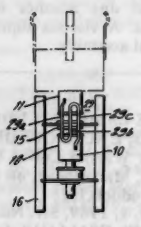
In a color picture tube of the single-gun, plural-beam type in which a central beam and two side beams originate in a common plane and are all made to pass through the center of an electron lens for focusing the beams on the color screen with the central beam emerging from the lens along the optical axis of the latter and the side beams emerging from the lens along paths that are oppositely divergent from the axis, the divergent side beams are acted upon by an electrostatic convergence deflecting device constituted by pairs of spaced plates arranged along the divergent paths and having voltages applied thereacross to produce electric fields by which the divergent side beams passing therethrough are deflected to converge at a common spot with the central beam on the apertured grill or mask associated fields the screen, and a main deflection yoke produces magnetic fields in the direction of the common plane of the beams and orthogonally thereto for causing the beams to scan the screen; the distances between the plates of each pair are varied in the direction perpendicular to the common plane in which the beams originate to correspondingly vary the strengths of the electric fields and thus correct distortions in the rasters of the side beams.

3,619,688

ELECTRON GUN WITH CONNECTOR OF ALTERNATE ELECTRODES SHIELDING INTERMEDIATE ELECTRODE

John McQueen, Bloomfield, and Leonard D. Minutillo, Sayreville, both of N.J., assignors to Griffiths Electronics Inc., Linden, N.J.

Filed Mar. 28, 1969, Ser. No. 811,507
Int. Cl. H01j *29/02, 19/42, 29/46*
U.S. Cl. 313—82 **3 Claims**



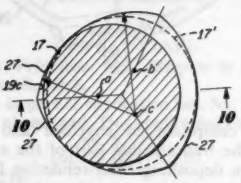
A substantially U-shaped electrical wire configuration intercoupling the pair of second anodes in a cathode-ray kinescope electron gun assembly for preventing arcing and

reducing electron beam drift in the presence of high-potential electric fields.

3,619,689
CATHODE-RAY TUBE WITH ELECTRODE SUPPORTED BY STRAPLIKE SPRINGS

Thomas Roy Martin, Lancaster, Pa., assignor to RCA Corporation

Filed Apr. 6, 1970, Ser. No. 25,654
Int. Cl. H01j 29/06
U.S. Cl. 313—85 8 Claims

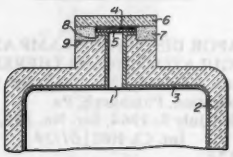


In a shadow mask-type color picture tube, the mask is detachably mounted in the faceplate cap by means of at least three metal studs, Having frustoconical tips, embedded in the cap sidewall, and a corresponding number of leaf springs each attached at one end to the mask and having a specially shaped aperture at the other end fitting over one of the stud tips. The aperture has the shape of a figure having three sides each of which is bowed outwardly in the plane of the spring with a curvature somewhat less than the curvature of adjacent curved stud surface, and also is curved convex to the normally straight stud surface, in planes normal to the sides. Alternatively, a tapered stud having a transverse cross section similar in shape to the specially shaped spring aperture may be used with a circular spring aperture that is curved convex to the stud surface in planes normal to the aperture.

3,619,690
THIN WINDOW CATHODE-RAY TUBE

Kaoru Tomii, and Hiroshi Miyama, both of Tokyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 20, 1968, Ser. No. 785,632
Claims priority, application Japan, Dec. 28, 1967, 43/112, Sept. 13, 1968, 43/66410
Int. Cl. H01j 29/18
U.S. Cl. 313—92 R 5 Claims

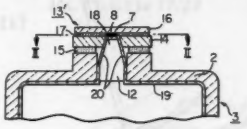


A thin window cathode-ray tube for recording the emission from a fluorescent material on a recording material placed before a faceplate in high resolution by using a very thin transparent plate as faceplate, in which an adhesive can be prevented to flow into a slit portion by a step structure provided at a junction surface between and envelope and the face.

3,619,691
PHOTOGRAPHIC RECORDING TUBE WITH A PHOSPHOR LAYER IN A THIN-WINDOW NARROW-SLIT FACEPLATE

Kaoru Tomi, Tokyo; Hiroshi Miyama, Tokyo; Tadao Muto, Chofu-shi, and Masahiko Kaneko, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1969, Ser. No. 798,408
Claims priority, application Japan, Feb. 16, 1968, 43/10166, May 24, 1968, 43/35855, Sept. 27, 1968, 43/70904
Int. Cl. G01d 9/42; H01j 29/24
U.S. Cl. 313—92 R 2 Claims

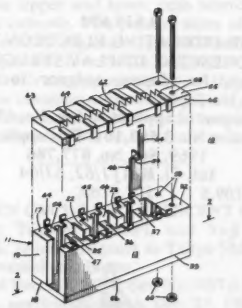


A faceplate of a thin-window photographic recording tube including a bulb face having provided therein a straight slit extending longitudinally of said bulb face. The faceplate features increased mechanical strength to withstand the atmospheric pressure and improved adhesion to the bulb face. The bonding agent for fastening the faceplate to the bulb face is advantageously isolated from the slit.

3,619,692
DYNODE ASSEMBLY FOR ELECTRON MULTIPLIER

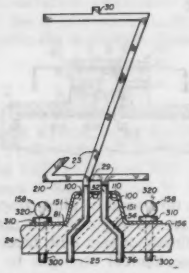
Cyril L. Day, Huntington, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 13, 1969, Ser. No. 849,675
Int. Cl. H01j 43/04, 43/18, 39/14
U.S. Cl. 313—105 9 Claims



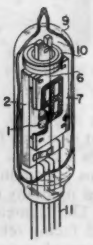
A miniature electron multiplier having a pair of complementary dynode support elements formed of ceramic material, each of the elements having a plurality of longitudinally spaced-apart projections extending transversely outwardly from a side thereof and mutually defining outwardly facing recesses therebetween. The elements are disposed with their sides in spaced, parallel facing relationship with the projections of one element located generally midway between the projections of the other element and respectively extending toward the recesses of the other element but having their outer ends spaced from the side thereof so as to define a generally serpentine channel. A plurality of dynode elements formed of relatively thin sheet metal are respectively seated in the recesses and brazed to the walls thereof. Top and bottom plate elements formed of ceramic material secure the support elements in assembled relation and close the channel. The dynode elements have integral leads which extend outwardly between the respective support element and plate element to the exterior of the assembly where they may be attached to a voltage divider resistance printed upon the outer surface of one of the cover plates.

3,619,693
INDICATOR TUBE HAVING MEANS FOR SEPARATING LEADS
Thomas D. Peterson, Somerville, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Filed Feb. 10, 1969, Ser. No. 797,915
Int. Cl. H01j *61/36, 11/66*
U.S. Cl. 313—109.5 3 Claims



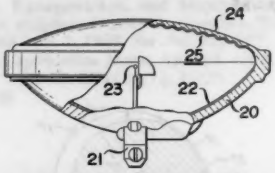
A miniature, cold cathode, gas-filled indicator tube which has an envelope of minimal diameter and length and includes an anode electrode and a stack of cathode character electrodes. The cathode electrodes include closely spaced cathode tabs to which similarly closely spaced tube pins are secured. The tube pins extend from the cathode tabs through the stem of the envelope so that they are accessible outside the tube. The tube pins are bent and spread apart as they pass through the stem so that they are relatively widely spaced outside the envelope adjacent to the tube stem.

3,619,694
CHARACTER-INDICATING ELECTRON TUBE WITH FLUORESCENT DISPLAY STRUCTURE
Mikiharu Tanji, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan
Continuation-in-part of application Ser. No. 676,580, Oct. 19, 1967, now Patent No. 3,508,101. This application Nov. 18, 1969, Ser. No. 877,786
Int. Cl. H01j *1/62, 63/04*
U.S. Cl. 313—109.5 3 Claims



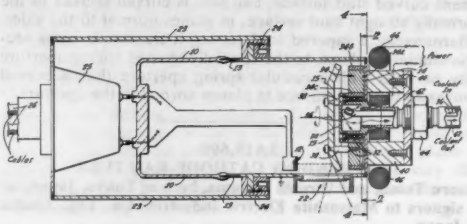
A fluorescent display tube of the triode construction is provided with an insulating substrate, an anode electrode including a plurality of fluorescent anode segments adapted to form characters and embedded in the insulating substrate, a single grid electrode disposed close to the anode segments and a filament in front of the grid electrode. The grid electrode is provided with a window common to the region of a pattern formed by the plurality of fluorescent anode segments and the window is provided with an electroconductive mesh.

3,619,695
FOG LAMP
Naoyoshi Nameda, and Tetsuhiro Kano, both of Yokohama-shi, Japan, assignors to Tokyo Shibarua Electric Co., Ltd., Kawasaki-shi, Japan
Filed Mar. 5, 1969, Ser. No. 804,632
Claims priority, application Japan, Mar. 9, 1968, 43/15156
Int. Cl. H01j *5/16*; H01k *1/32*
U.S. Cl. 313—112 4 Claims



A fog lamp comprises an envelope and light source therein. Inside the transmissible part of the envelope is attached a vacuum depositing color-rendering film consisting of cadmium sulfide, cadmium selenide and inorganic material such as germanium and/or silicon.

3,619,696
ELECTRIC DRIVE MOTOR FOR ROTATABLY DRIVING THE ANODE OF AN X-RAY TUBE
Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Los Angeles, Calif.
Filed Nov. 17, 1969, Ser. No. 877,303
Int. Cl. H01j *1/44, 35/10*
U.S. Cl. 313—149 9 Claims

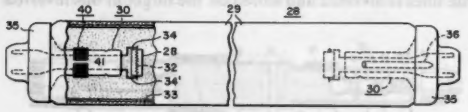


A high-voltage, high-vacuum X-ray tube is provided which includes a rotating target electrode for increased target life, and which also includes a unique and improved electric motor for rotatably driving the target electrode, the motor having a flat, "pancake" configuration, with a rotor inside the evacuated envelope of the X-ray tube, and with an externally positioned stator.

3,619,697
MERCURY VAPOR DISCHARGE LAMP AND PRESSURE-REGULATING MEANS THEREFOR
George S. Evans, Caldwell, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 9, 1964, Ser. No. 381,503
Int. Cl. H01j *61/24*
U.S. Cl. 313—174 20 Claims

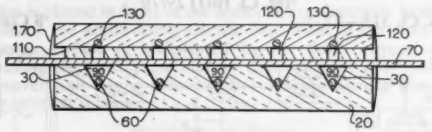
The mercury vapor pressure within an operating fluorescent lamp or similar device is controlled by a quantity of mercury-amalgamative material that is retained at a predetermined location within the lamp by holding means secured to one of the mount assemblies or the lamp envelope. The amalgamative material preferably comprises indium and is held in place by a formaminous assembly. In the case of indium, the formed indium-mercury amalgam contains from about 80 to 95 atomic percent indium and both the lamp performance (light output versus ambient temperature) and amalgam retention are significantly improved with

indium contents at the high end of the aforesaid atomic percent range. Various amalgam-holding structures, including



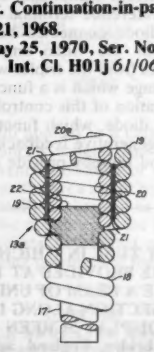
temperature-compensating types employing bimetal elements, and a method of fabricating the vapor-pressure control components are also disclosed.

3,619,698
DISPLAY PANEL
Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of application Ser. No. 850,841, Aug. 18, 1969, now abandoned. This application Feb. 5, 1970, Ser. No. 8,773
Int. Cl. H01j *61/30*
U.S. Cl. 313—210 **9 Claims**



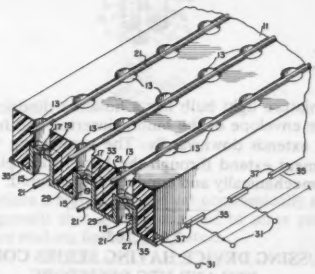
A display panel includes a plurality of gas-filled cells which comprise apertures in an insulating plate, and each cell has a cathode at its lower end and an anode at its upper end, from which light exits to a viewer. The walls of the cells are made of light-reflecting material so that nonaxial light rays generated at each cathode reflect back and forth upwardly along the cell walls and exit at different angles. With light rays thus exiting at a wide range of angles, an effective wide viewing angle is presented to a viewer. The surface of the apertured plate which faces the viewer is also light-absorbent to minimize light reflection therefrom toward the viewer.

3,619,699
DISCHARGE LAMP HAVING CAVITY ELECTRODES
John E. White, Cleveland Heights, Ohio, assignor to General Electric Company. Continuation-in-part of application, Ser. No. 769,037, Oct. 21, 1968.
Filed May 25, 1970, Ser. No. 40,134
Int. Cl. H01j *61/06*
U.S. Cl. 313—211 **16 Claims**



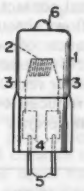
A high-intensity electric discharge lamp having cavity electrodes operating in the hollow cathode mode. Penetration of the arc terminus into the electrode cavity is assisted by vapor breathing which injects plasma into the cavity during AC reignition after current zero. Breathing is favored by a cavity which is gastight and which has a depth not substantially greater than the terminus penetration. Relatively low temperatures deep within the cavity are avoided by providing enhanced thermal coupling between the forward end of the cavity member and the radiation shield surrounding it, and also by thermal insulation between the sides of the cavity member and the shield. Emission material located within the lower portion of the cavity favors deep terminus penetration. Projection of the radiation shield beyond the cavity member toward the other electrode is avoided.

3,619,700
GAS CELL DISPLAY PANEL UTILIZING CORRUGATED ELECTRODES
George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Filed July 8, 1970, Ser. No. 53,145
Int. Cl. G11c *11/28*
U.S. Cl. 313—217 **8 Claims**



A display panel utilizing an array of gas-filled cells in an insulator sheet the cells being arranged in upper and lower layers of aligned cells with pairs of upper and lower cells separated by a common cathode electrode. The cathode electrodes are parallel strips corrugated in a series of rectangular waves, each flat elevated portion of a corrugation being embedded in an aperture of the insulator sheet and dividing the aperture into upper and lower cells interconnected by a tiny hole in the cathode. The parallel sides of a corrugation form walls of a cell. A single corrugated electrode thus forms a column of upper and lower cells across the panel. Pairs of associated anodes cross opposite ends of the apertures perpendicular to the common cathodes preferably in slots in the insulator to form rows of cells. Pairs of baseplates are sealed to the insulator sheet to form an hermetic unit.

3,619,701
HALOGEN CYCLE INCANDESCENT LAMPS
Keiichi Sugano; Takashi Ohmori, and Yoji Yuge, all of Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Dec. 23, 1969, Ser. No. 887,610
Claims priority, application Japan, Dec. 27, 1968, 43/95779
Int. Cl. H01k *1/50*
U.S. Cl. 313—222 **8 Claims**

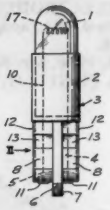


A halogen lamp exhibiting a good regenerative halogen cycle is sealed with an inert or nitrogen gas, chlorine and fluorine, preferably, in the form of a hydrocarbon halide. Quantities of chlorine and fluorine are respectively from 0.05 $\times 10^{16}$ to 1.00 $\times 10^{16}$ gram atoms of chlorine and from 0.05 $\times 10^{16}$ to 1.50 $\times 10^{16}$ gram atoms of fluorine per cubic centimeter of the inner volume of the lamp.

3,619,702
MINIATURE LIGHT BULB

Paul Albrecht, Bamberg, Germany, assignor to W. Albrecht-KG. Bamberg, Bamberg, Germany

Filed Mar. 26, 1969, Ser. No. 810,762
Claims priority, application Germany, Apr. 6, 1968, A 29602
Int. Cl. H01j *5/48, 5/50*
U.S. Cl. 313—318 **10 Claims**

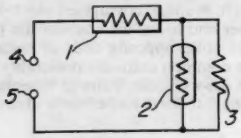


A miniature light bulb has a hollow cylindrical base into which the envelope of the bulb is inserted and from which a flat plug extends downwardly. The connecting wires of the bulb filament extend through the base to the plug to which they are mechanically and conductively secured.

3,619,703
DEGAUSSING DEVICE HAVING SERIES CONNECTED PTC AND NTC RESISTORS

Hiroshi Yamashita, Neyagawa-shi; Kazuo Ishikawa, Kadoma-shi, and Masanori Fujimura, Moriguchi-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 9, 1969, Ser. No. 831,451
Claims priority, application Japan, June 17, 1968, 43/42396
Int. Cl. H01f *13/00;* **H01c** *7/02*
U.S. Cl. 315—8 **3 Claims**



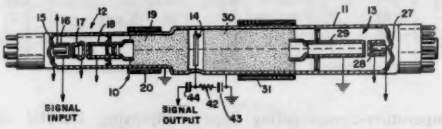
A degaussing device for the picture tube of a color television receiver magnetized by terrestrial magnetism causing color-contamination is described. The device comprises a resistor having a positive temperature coefficient of resistance (PTC resistor), a resistor having a negative temperature coefficient of resistance (NTC resistor), and a coil wound on the picture tube for degaussing, the PTC resistor being connected in series to a parallel circuit of the NTC resistor and the degaussing coil, wherein the PTC resistor and the NTC resistor are in good thermal contact. A sufficiently large current for degaussing first flows through the coil and then the PTC resistor, the resistance of which is thereby raised, reduces the current. The NTC resistor heated by the PTC resistor therefore shows a lower resistance than that of the coil. Consequently, a further reduced current flows through the coil which gives little interference with the working of the picture tube.

3,619,704
SIGNAL STORAGE TUBE SYSTEM WITH ENHANCED SIGNAL-TO-NOISE RATIO

James W. Schwartz, Western Springs, Ill.

Filed July 9, 1969, Ser. No. 840,419
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 ST **6 Claims**

Alternative systems are disclosed for enhancing the signal-to-noise ratio in a signal storage tube. The intensity of the write beam is amplitude-modulated and it sweeps the target in a vertical raster. The read beam has a constant intensity and sweeps the target in a horizontal raster. In one embodiment, the video signal for one of a predetermined number of write lines is inverted and stored on the target in this inverted

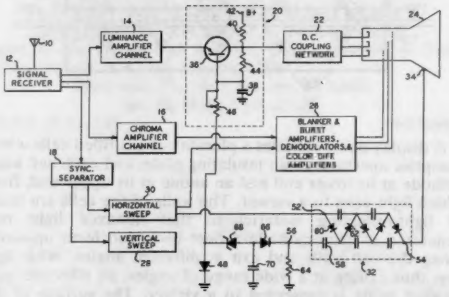


form thus translating the frequency band of the read signal to a higher value and out of the frequency range of noise caused by the physical characteristics of the target and the collection optics. In a second embodiment, a signal representative of the background noise is generated and subtracted from the output signal.

3,619,705
AUTOMATIC BEAM CURRENT LIMITER CIRCUITRY

George Cleveland Waybright, Batavia, N.Y., assignor to GTE Sylvania Incorporated

Filed Oct. 13, 1969, Ser. No. 865,774
Int. Cl. H01j *29/70*
U.S. Cl. 315—22 **8 Claims**



In a television receiver in which a video amplifier is DC coupled as a signal source to the one or more cathodes of a picture tube and the high-voltage power supply for the picture tube includes a voltage tripler coupled between the retrace pulse output of a high-voltage circuit and the second anode of the picture tube, a circuit for automatically limiting picture tube beam current comprising a resistor connected between the tripler reference terminal and ground, and a rectifier and Zener diode connected between that resistor and a bias circuit for the video amplifier. The resistor develops voltage pulses from the tripler which when rectified provide a control voltage which is a function of picture tube beam current. Application of this control voltage to the bias circuit via the Zener diode, which functions as a threshold device, provides a degenerative feedback signal operative to limit beam current and thereby provide overload protection for the picture tube.

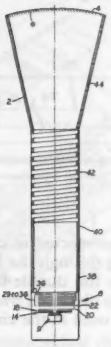
3,619,706
CATHODE-RAY TUBE IN WHICH SCREENING ELECTRODES ARE PROVIDED AT THE ELECTRON GUN TO PRODUCE A BEAM OF UNIFORM DENSITY OVER ITS CROSS SECTION ALONG ITS PATH TO THE DISPLAY SCREEN

Douglas S. Hills, Tonbridge, England, assignor to The Rank Organization Limited, London, England. Continuation of Ser. No. 670,328, Sept. 25, 1967.

Filed Feb. 26, 1970, Ser. No. 14,610
Claims priority, application Great Britain, Sept. 28, 1966, 43,364/66
Int. Cl. H01j *29/56*
U.S. Cl. 315—31 **5 Claims**

A discharge system including a device such as a cathode-ray tube has an electron gun in which an accelerating elec-

trode is placed close to a planar emissive surface of a cathode and is held at a small positive potential to provide an accelerating electric field having unipotential surfaces which are parallel to the electron emissive surface of the cathode. To screen the accelerating field having these unipotential surfaces from the further accelerating electrodes in the gun



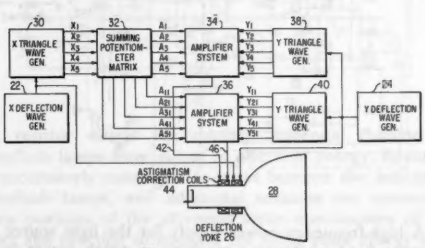
or in the cathode-ray tube a screening electrode or electrodes is placed in front of the accelerating electrode. In consequence the accelerating electric field close to the electron emissive surface is undistorted by the fields beyond the screening electrode(s), so that the electron beam is devoid of crossover and has a substantially uniform current density over its cross section.

3,619,707

ASTIGMATISM CORRECTION FOR ELECTRON BEAM DEVICES

Elvin Dean Simshauser, Columbus, N.J., assignor to RCA Corporation

Filed Aug. 8, 1969, Ser. No. 848,598
Int. Cl. H01j *29/56*
U.S. Cl. 315—31 R **12 Claims**



The correction field applied to a cathode-ray beam device substantially fully cancels astigmatism at a plurality of discrete, known in advance positions of the beam, preferably uniformly spaced over the area swept by the beam. The value of the field automatically is changed as the beam moves as a function of the relative distances of the beam from a plurality of said discrete positions to at least partially cancel astigmatism at the remaining positions of the beam.

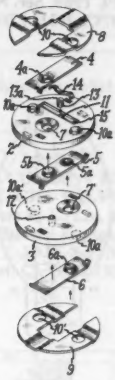
3,619,708

SURGE VOLTAGE ARRESTER ASSEMBLY HAVING INTEGRAL CAPACITOR MOUNTING AND CONNECTING MEANS

Earl M. Stetson, and Thomas J. Carpenter, both of Pittsfield, Mass., assignors to General Electric Company

Filed Jan. 12, 1970, Ser. No. 2,147
Int. Cl. H02h *7/24, 9/06*
U.S. Cl. 315—36 **16 Claims**

A sparkgap assembly for a low-voltage lightning arrester is provided with a sparkgap-shunting capacitor mounting and connecting means that is an integral part of the sparkgap assembly. The integral capacitor mounting and connecting



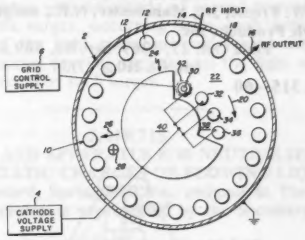
means comprises a highly reliable yet economically manufactured arrangement that is well adapted to mass production techniques for making lightning arresters.

3,619,709

GRIDDED CROSSED FIELD TRAVELING WAVE DEVICE

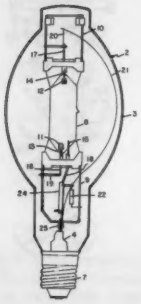
Kenneth W. Dudley, Sudbury, and George H. MacMaster, Waltham, both of Mass., assignors to Ratheon Company, Lexington, Mass.

Filed July 6, 1970, Ser. No. 52,321
Int. Cl. H01j *25/34*
U.S. Cl. 315—39.3 **5 Claims**



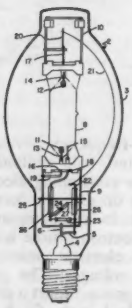
A high-power high-frequency device is disclosed having a thermionically actuated cold cathode secondary electron source and means for controlling electron beam current interacting with energy on either a reentrant or nonreentrant propagating structure. In an exemplary embodiment a grid-controlled primary electron source is coupled to an array of individual secondary electron emissive members biased at sequentially varying voltages. The primary and secondary electron emitters are spaced apart a distance of approximately one electron cycloid path. Such emitters are disposed within a section of a cold cathode source of substantial size. Impingement of electrons upon each successive secondary electron emitting surface results in an electron emission multiplication process heretofore unattainable with cold cathode structures actuated simply by pulses of the input RF energy to be amplified. Operation of the device may be rapidly terminated by biasing of the grid-controlled electrode having very low voltage requirements with the current in the electron beam and power output decaying to zero in a relatively few revolutions of the electron spoke around the cathode structure.

3,619,710
HIGH-PRESSURE ELECTRIC DISCHARGE LAMP HAVING ELECTROLYSIS-PREVENTING MEANS
John F. Waymouth, Marblehead, Mass., assignor to Sylvania Electric Products Inc.
Filed Oct. 29, 1969, Ser. No. 872,269
Int. Cl. H01j 17/34
U.S. Cl. 315—47 1 Claim



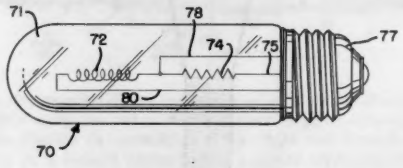
The arc tube of an arc discharge lamp has two main electrodes and a starter electrode adjacent one of them, the starter electrode being electrically connected to the adjacent electrode through a resistor external of the arc tube. The starter electrode is electrically connected to the other main electrode through a thermally operative switch and a second resistor. In normal operation, the switch opens after lamp ignition to isolate the starter electrode from the circuit of the other main electrode and to place the starter electrode at substantially the same potential as the adjacent main electrode.

3,619,711
HIGH-PRESSURE METAL HALIDE ELECTRIC DISCHARGE LAMP
Robert W. Freese, Jr., Manchester, N.H., assignor to Sylvania Electric Products, Inc.
Filed Oct. 27, 1969, Ser. No. 869,630
Int. Cl. H01j 17/34
U.S. Cl. 315—60 1 Claim



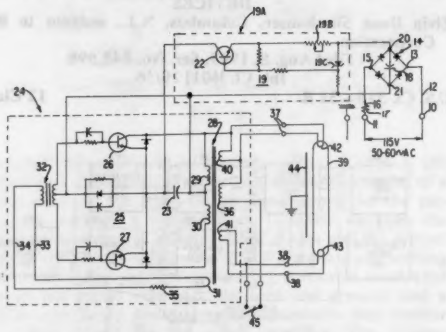
The arc tube of an arc discharge lamp has two main electrodes and a starter electrode adjacent one of them, the starter electrode being electrically connected to the adjacent electrode through a rectifying device, such as a diode, external of the arc tube. The polarity of the rectifier is such as to permit the starter electrode to attain a voltage positive with respect to the adjacent electrode but to substantially prevent a negative voltage therebetween.

3,619,712
FILAMENT-PROTECTING DEVICE AND SHOCK RESISTANT LAMP
Ronald C. Koo, Weehawken, and Joel Shurgan, Washington Twp., both of N.J., assignors to Duro-Test Corporation, Bergen, N.J.
Filed Oct. 22, 1969, Ser. No. 868,506
Int. Cl. H01j 7/44; H05b 39/00
U.S. Cl. 315—94 13 Claims



Incandescent lamps connected in circuits to keep a maintenance current flowing through the lamp filament when the lamp is off to improve the ductile-brittle properties of the filament. Lamps are also disclosed which have an internal impedance element to be used in the circuits for producing the maintenance current.

3,619,713
HIGH-FREQUENCY LAMP CIRCUIT FOR COPYING APPARATUS
Boleslaw C. Biega, Deerfield, and Bodo M. Wolfframm, Clarendon Hills, both of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.
Filed Apr. 1, 1969, Ser. No. 811,831
Int. Cl. H05b 41/29, 41/391
U.S. Cl. 315—105 6 Claims

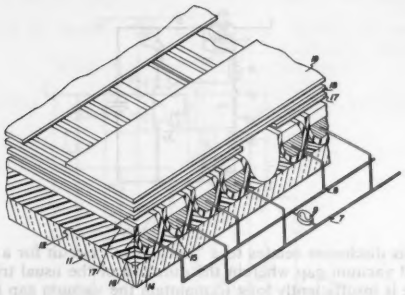


A high-frequency power supply for the light source of a xerographic-type copying machine in which power from a normal 50-60-cycle AC input is rectified and regulated to provide a constant current or constant voltage DC input to a high-frequency oscillator-inverter providing output power at a frequency in the order of 20,000 c.p.s. or above to a light source comprising one or more gaseous-type lamps. In a modified circuit the DC input to the inverter is regulated by a solid-state chopper controlled by a magnetic amplifier pulsed by a free-running multivibrator and modulated by the input current.

3,619,714
PANEL DISPLAY DEVICE
Paul F. Evans, Pittsford; Harold D. Lees, Rochester, and Martin S. Maltz, Fairport, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Apr. 14, 1969, Ser. No. 815,570
Int. Cl. H05b 37/00; H01j 1/62
U.S. Cl. 315—169 9 Claims

An electroluminescent display panel having solid state storage layers, an excitation source and an ion-generating

source. The application of excitation current causes luminescence of the panel. Ions carried through a dielectric layer are injected into a semiconductor control layer to alter the impedance state thereof. The change in the impedance state of the control layer alters the current flow within the



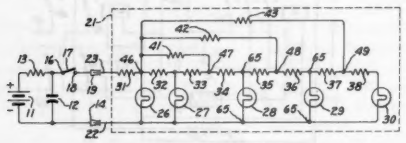
panel resulting in a corresponding change in the level of luminescence. By selectively addressing the conductors either sequentially or simultaneously a pattern or image is formed on the panel face. The panel may be erased by the addressing voltage or by a separate erasing voltage source.

3,619,715

RESISTOR CIRCUIT FOR SEQUENTIALLY FLASHING PHOTOFLASH LAMPS

Sang-Chul Kim, Cleveland Heights, Ohio, assignor to General Electric Company

Filed May 21, 1970, Ser. No. 39,418
Int. Cl. H05b *37/00*
U.S. Cl. 315—232 **12 Claims**



A resistor circuit for causing sequential flashing of photoflash lamps from pulses of electrical energy. Resistors are successively connected in series between the individual photoflash lamps, and additional resistors are connected across portions of the aforesaid series combination of resistors and function to equalize the firing pulse energy successively applied in turn to each lamp.

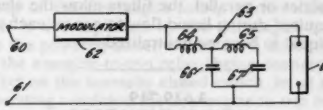
3,619,716

HIGH-FREQUENCY FLUORESCENT TUBE LIGHTING CIRCUIT AND AC DRIVING CIRCUIT THEREFOR

Joel S. Spira, Allentown, and Joseph Licata, Schnecksville, both of Pa., assignors to Lutron Electronics Co., Inc., Emmaus, Pa.

Filed July 23, 1969, Ser. No. 843,927
Int. Cl. H05b *41/233, 41/392*
U.S. Cl. 315—244 **15 Claims**

A sinusoidal voltage source in series with a fluorescent, mercury vapor, sodium vapor device, etc. is pulsed at a given pulse repetition rate with the pulse having a given conduction time. Two or more tubes can sequentially conduct pulses with the current input being a continuous sinusoid. A particular pulsing circuit contains a modified pulse-forming network consisting of one or more stages of a closed series connection of a choke and two capacitors. The chokes of each stage are connected in series. The modified pulse-forming network is used as a frequency converter per se, as DC to AC



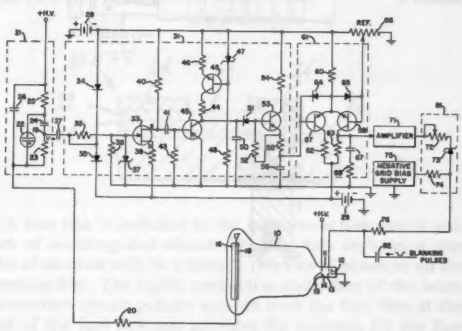
converter, or specifically is in parallel with a fluorescent tube load.

3,619,717

ELECTRON BEAM CURRENT REGULATOR FOR A LIGHT VALVE

Ho-chol Lee, and Thomas P. L. Liu, both of Liverpool, N.Y., assignors to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,618
Int. Cl. G05f *1/00*
U.S. Cl. 315—307 **7 Claims**



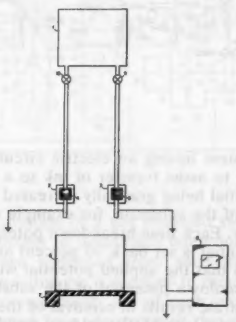
Electron beam current in a light valve is maintained at a uniform value by feedback apparatus which senses current at the medium upon which a raster is generated by the beam and controls the rate of electron emission from an electron gun in accordance with amplitude of sensed current. Initial cathode current surges, occurring upon each initiation of energization of the light valve, are suppressed within the feedback apparatus, leaving operation of the light valve essentially unaffected by such surges.

3,619,718

METHOD AND APPARATUS FOR NEUTRALIZING ELECTROSTATIC CHARGES ON FLOWING LIQUIDS

Joseph T. Leonard, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy

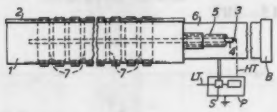
Filed Feb. 20, 1970, Ser. No. 12,947
Int. Cl. B65g *53/34*; **B01d** *25/04*; **H05f**
U.S. Cl. 317—2 R **12 Claims**

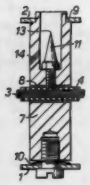


A method and apparatus whereby electrostatic charges contained in a liquid hydrocarbon are neutralized by utilizing

filters which impart opposite charges to the liquid. An organic filter element causes a positive charge and an inorganic filter element causes a negative charge. When properly arranged in series or parallel, the filters allow the electrostatic charges acquired during liquid flow to cancel each other and cause the liquid to become neutralized.

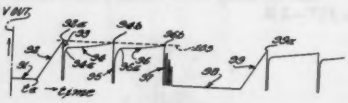
3,619,719
STATIC ELIMINATORS
John Reginald Waller, and John Richard Radington-Meech, both of London, England, assignors to Industrial Electrical Company Limited, London, England
Filed June 12, 1969, Ser. No. 832,605
Claims priority, application Great Britain, June 17, 1968, 28,744/68, Feb. 28, 1969, 10,755/69
Int. Cl. H05f *3/00*
U.S. Cl. 317—2 F **7 Claims**





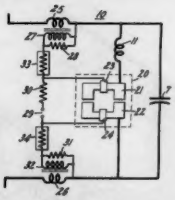
A static eliminator for blowing a stream of ionized air on to an exposed surface having a static charge to neutralize its charge and blow off attracted particles, the eliminator comprising an electrodé within an insulating sleeve through which air under pressure is passed and ionizing voltage being applied between the electrode and a metal surface hidden from the electrode by the sleeve.

3,619,720
ELECTRICALLY ASSISTED PRINTING SYSTEM
Daniel A. Coberley, Danville, Ill., assignor to Hurletron Incorporated, Danville, Ill.
Filed Aug. 28, 1969, Ser. No. 853,672
Int. Cl. B41f *9/06*; **B41m** *5/20*
U.S. Cl. 317—3 **1 Claim**



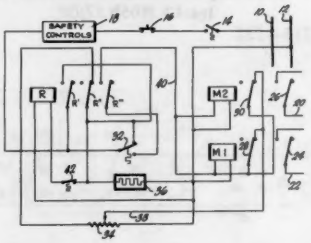
A printing system having an electric circuit supplying an output potential to assist transfer of ink to a dielectric substrate, the potential being gradually increased up to a breakdown potential of the substrate, for example of a rate of 10 percent per hour. Each time breakdown potential is reached, the applied potential is set back 10 percent and the increase started again, so that the applied potential will follow variations in the breakdown potential of the substrate. A severe fault in the substrate results in removal of the output potential during a timed interval followed by a rapid potential buildup toward breakdown potential, after which the normal cycle is resumed.

3,619,721
TRIGGERED VACUUM GAP KEEP-ALIVE CIRCUIT
Willem F. Westendorp, Schenectady, N.Y., assignor to General Electric Company
Filed June 1, 1970, Ser. No. 42,327
Int. Cl. H02h *7/16*
U.S. Cl. 317—12 A **7 Claims**



This disclosure relates to a "keep-alive" circuit for a triggered vacuum gap wherein the duration of the usual trigger pulse is insufficiently long to maintain the vacuum gap in an active state for more than one half cycle at the power line frequency. A circuit utilizing current transformers is described wherein a current transformer provides the trigger pulse necessary to maintain the vacuum gap in an active state for as long as necessary to protect electrical equipment shunted by the vacuum gap.

3,619,722
REFRIGERATION PROTECTIVE SYSTEM
Melvin C. Gill, and William M. Dartt, both of Jackson, Mich., assignors to Acme Industries, Inc., Jackson, Mich.
Filed May 4, 1970, Ser. No. 34,412
Int. Cl. H02h *7/08*
U.S. Cl. 317—13 R **11 Claims**

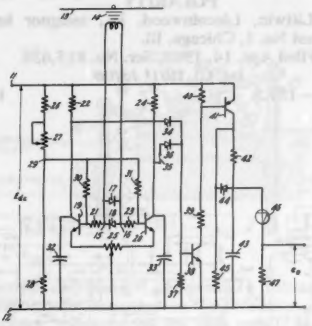


A protective control system for a refrigeration circuit incorporating a current-sensitive, manually resettable switch employed in conjunction with a time delay switch and a resistor wherein the current-sensitive switch is adapted to be selectively connected to the resistor, and tripped open thereby, in the event a malfunction occurs in the compressor motor starter means, or an abnormal condition exists at the compressor motor, as sensed by a protective motor switch. The use of the time delay switch prevents short cycling of the refrigeration circuit and upon the current-sensitive switch being connected in series across the load for a predetermined time interval with the resistor, the current-sensitive switch will open to protect the circuit, requiring manually resetting, and provide an opportunity for inspection of the apparatus prior to restarting of the compressor motor.

3,619,723
SENSITIVE PEAK CURRENT DETECTOR FOR GROUND FAULT PROTECTION CIRCUITS
John P. Walden, Schenectady, N.Y., assignor to General Electric Company
Filed Sept. 30, 1970, Ser. No. 76,828
Int. Cl. H01h *47/18*; **H02h** *1/04*
U.S. Cl. 317—18 R **12 Claims**

A full- or half-wave peak current detector of a few milliamperes of power circuit fault current includes, for each

polarity, a normally conducting first transistor continuously supplied with base current. In response to sensing an instantaneous above-threshold fault current, the base current is diverted through a mirror-image connected second transistor, turning off the first transistor for so long as the above-



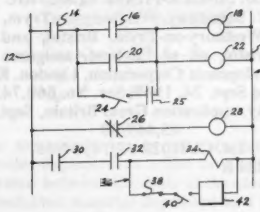
threshold current exists. For full-wave detection the role of the transistors is reversed on the other polarity. This actuates one or more series RC filter networks to delay the output indication and reduce the detector sensitivity to high-frequency transients or noise. The valid power frequency output signal opens a circuit interrupter.

3,619,724

FUEL BURNER SAFETY CONTROL CIRCUIT

Thomas W. Brown, Vernon; Michael A. Delin, West Simsbury, and Robert D. Scoville, Torrington, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed June 11, 1970, Ser. No. 45,369
Int. Cl. H02h *3/24*
U.S. Cl. 317—36 TD **7 Claims**



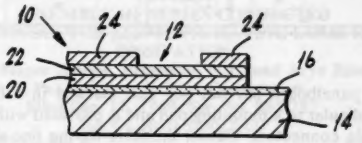
A fuel burner safety control circuit for burner safety shutoff valves functioning in different operational modes depending upon the occurrence of an interruption in power to the circuit or an unsafe operating condition in the overall system so as to be capable of distinguishing between a momentary power interruption where the burner should not be shut down and an emergency condition where the burner should be shut down substantially immediately. The safety control circuit has a deenergize-to-trip burner safety shutoff valve with an integral time delay to maintain burner safety shutoff valve energization during momentary power interruption, and a bypass arrangement permitting the time delay to be bypassed during emergency trip conditions to provide substantially immediate burner safety shutoff valve deenergization for closing down the burner system. This capability of distinguishing between momentary power interruptions and emergency trip conditions is accomplished by using a circuit having parallel time delay relays to activate switches set in series in a time delay circuit. The time delay relays function in opposite energization senses (i.e., energize to trip and deenergize to trip) in activating the switch with which it is associated, one switch being normally closed and the other closed on application of power to the safety control circuit. On a power interruption, both relays would assume a deenergized state maintaining the switches closed for a set period of time to continue the integrity of the time delay circuit to prevent trip of the deenergize-to-trip burner safety shutoff valve. This is accomplished by the deenergize-to-trip relay holding in the powered closed switch for a discrete period of time and the energize-to-trip relay (being deenergized) having no effect on the normally closed switch. In an emergency unsafe operating condition the deenergize-to-trip relay would again be deenergized to maintain the powered closed switch closed, but the energize-to-trip relay would assume an energized state substantially immediately opening the normally closed switch to trip the deenergize-to-trip burner safety shut off valve for closing down the burner system.

3,619,725

ELECTRICAL FUSE LINK

Ralph Robert Soden, Mendham, and William John Greig, Somerville, both of N.J., assignors to RCA Corporation

Filed Apr. 8, 1970, Ser. No. 26,627
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 A **3 Claims**



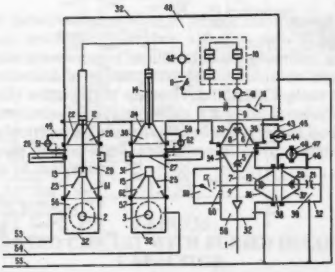
A fuse link is included in the interconnection circuit pattern of an integrated circuit. The fuse link includes a thin film of titanium with or without a thin film of platinum on the titanium film. The highly conductive metal film of the interconnection circuit pattern extends over the fuse film at the end of the fuse link and provides the contacts for the fuse link.

3,619,726

METAL CLAD SWITCH PLANTS FOR HIGH VOLTAGES WITH OBTURATING MEANS FOR PREVENTING DESTRUCTIVE PRESSURE RISE

Rintje Boersma, Harmelen, Netherlands, assignor to N.V. COQ, Utrecht, Netherlands

Continuation of application Ser. No. 747,313, July 24, 1968, now abandoned. This application June 5, 1970, Ser. No. 41,781
Int. Cl. H01h *33/82, 33/54*
U.S. Cl. 317—103 **14 Claims**



The metal envelope of a gas insulated switch plant is divided into a number of detachably interconnected compartments which are separated from each other in gastight manner and insulating gas is supplied to these compartments. Some of the compartments are of such small volumes that the heat generated by a short circuit therein, for example, might cause a pressure rise of the insulating gas which is sufficient to rupture the compartment. A conduit is provided between each of these small compartments and another com-

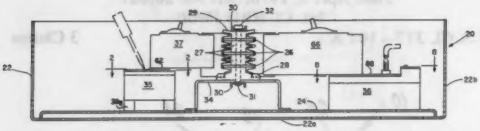
partment which is itself of large enough volume, or which is cumulatively with the first compartment of large enough volume, so as to prevent such destructive pressure rise. Each such conduit is normally blocked or substantially blocked by a rupturable diaphragm which breaks, in response to the inception of a destructive pressure rise, to allow full flow communication between the two compartments so connected.

3,619,727

ELECTRICAL PANELBOARD HAVING PLUG-IN LINE AND LOAD CONNECTIONS TO CIRCUIT BREAKER

Wilhelm T. Hackenbroch, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Jan. 12, 1970, Ser. No. 2,149
Int. Cl. H02b *1/04*
U.S. Cl. 317—119 **9 Claims**



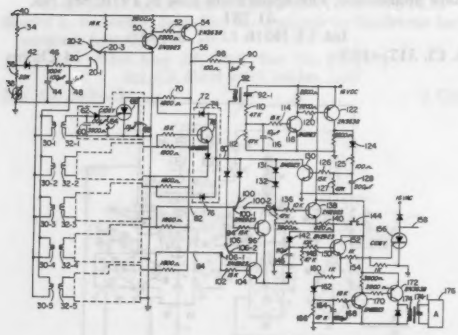
The panelboard has flat bus bars stacked in a direction perpendicular to a mounting pan and is provided with plug-in load-side connectors. Circuit breakers having line-side jaws for plugging onto the bus bars by movement parallel to the mounting pan are provided with stab terminals for plugging into jaws of the connectors. Load wires are secured to terminals of the connectors and need not be disturbed when a circuit breaker is plugged into or removed from the panelboard.

3,619,728

AUTHORIZATION TYPE OF CONTROL SYSTEM

Irving B. Cooper, Jr., Marblehead, Mass., assignor to Notifier Company, Lincoln, Nebr.

Filed Oct. 27, 1969, Ser. No. 869,788
Int. Cl. E05b *49/02*
U.S. Cl. 317—134 **20 Claims**



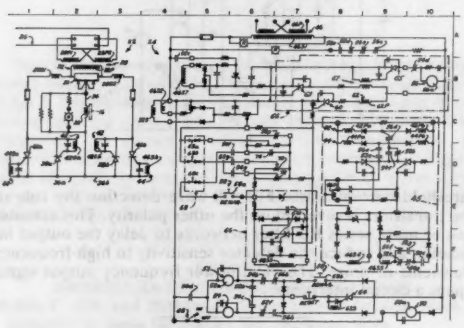
An authorization type of control system includes a data sensor having a plurality of data sensing positions, first circuitry for generating an output signal as a function of data sensed by each of the data positions, second circuitry responsive to a request signal to actuate the first circuitry to sense each of the data positions, third circuitry for producing an authorization signal in response to output signals from the first circuitry indicating a predetermined data item at each of the data positions, and fourth circuitry responsive to an incorrect output signal from the first circuitry from any one of the data positions for preventing generation of the authorization signal by the third circuitry for a predetermined period of time after termination of the request signal.

3,619,729

SOLID-STATE ELECTRIC CIRCUIT FOR REVERSING POLARITY

Arthur K. Littwin, Lincolnwood, Ill., assignor to Littwin Family Trust No. 1, Chicago, Ill.

Filed Apr. 14, 1969, Ser. No. 815,638
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **10 Claims**



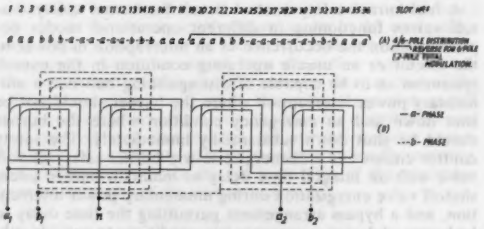
Electric circuit for reversing polarity, by solid-state components and without physically or mechanically opening the circuit establishing the polarity, such as by switches.

3,619,730

TWO-SPEED, SINGLE-PHASE ELECTRIC MOTOR

Alexander R. W. Broadway, Westbury-on-Trym, Bristol; William Fong, Westbury-on-Trym, Bristol, and Gordon H. Rawcliffe, Bristol, all of England, assignors to National Research Development Corporation, London, England

Filed Sept. 24, 1969, Ser. No. 860,743
Claims priority, application Great Britain, Sept. 25, 1968, 45,449/68
Int. Cl. H02k *17/14, 17/16*
U.S. Cl. 318—224 R **9 Claims**



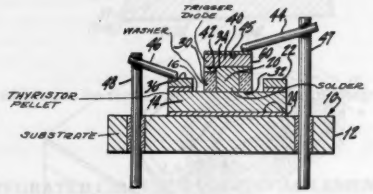
A two-speed, single-phase, alternating current motor having a concentric wound stator winding comprising a main energizing winding and an auxiliary starting winding, the main winding (or both windings) being tapped and arranged for reconnection at one speed to provide current reversal in selected winding parts, thus providing pole-changing by the known method of pole-amplitude modulation.

3,619,731

MULTIPLE PELLET SEMICONDUCTOR DEVICE

Lawrence K. Baker, Clinton, and Lawrence R. Shardlow, South Plainfield, both of N.J., assignors to RCA Corporation

Filed Oct. 11, 1968, Ser. No. 766,786
Int. Cl. H01l 1/08, 1/10, 1/14, 1/22
U.S. Cl. 317—234 R 5 Claims



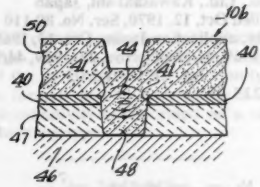
A semiconductor device comprises a substrate, a first semiconductor pellet mounted on the substrate, an insulating material washer mounted on the first pellet, and a second semiconductor pellet mounted on the washer. The second pellet is rigidly secured to the washer and the first pellet, and electrically connected to the first pellet, by means of a solder filling the washer central opening and bonded to both pellets.

3,619,732

COPLANAR SEMICONDUCTOR SWITCH STRUCTURE

Ronald G. Neale, Birmingham, Mich., assignor to Energy Conversion Devices, Inc.

Filed May 16, 1969, Ser. No. 825,236
Int. Cl. H03k 17/00; H01l 5/02, 3/00
U.S. Cl. 317—234 R 11 Claims



A coplanar semiconductor switch structure comprises a pair of electrodes deposited as a film on a suitable substrate with a gap formed between the ends of the electrodes, and an active semiconductor material deposited as a film in the gap between the ends of the electrodes. The ends of the deposited electrodes are so formed as to provide a minimum gap distance therebetween with increasing gap distance on each side thereof to provide a preferred location for the conducting path or paths through the active semiconductor material between the electrodes. The film thickness of the deposited acting semiconductor material is greater than the largest transverse dimension or diameter of the conducting path or paths so to be totally confined in the material. The active semiconductor material may be made to extend substantially equally from each side of the gap between the electrodes so that the current conducting path or paths may be symmetrical about an axis between the electrodes.

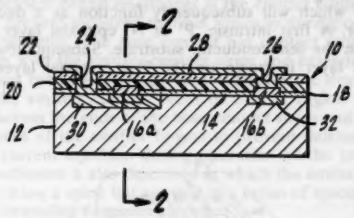
3,619,733

SEMICONDUCTOR DEVICE WITH MULTILEVEL METALIZATION AND METHOD OF MAKING THE SAME

William John Greig, Somerville, N.J., assignor to RCA Corporation

Filed Aug. 18, 1969, Ser. No. 850,822
Int. Cl. H01l 5/06
U.S. Cl. 317—234 R 5 Claims

A semiconductor device including a flat wafer of a semiconductor material, a first level metallization pattern on the wafer, a dielectric on the wafer and covering the first level metallization pattern, and a second level metallization pattern on the dielectric. The dielectric comprises a layer of



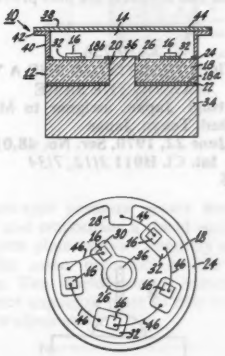
a plastic coated on the wafer and covering the first level metallization pattern and a layer of silicon oxide coated on the plastic layer. The second level metallization pattern is on the silicon oxide layer.

3,619,734

ASSEMBLY OF SERIES CONNECTED SEMICONDUCTOR ELEMENTS HAVING GOOD HEAT DISSIPATION

Jacques Mayer Assour, Princeton, N.J., and Arye Rosen, Elkins Park, Pa., assignors to RCA Corporation

Filed Dec. 17, 1969, Ser. No. 885,757
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 8 Claims



A high power semiconductor device comprising a housing having an enclosed chamber therein and a plurality of semiconductor elements mounted in the chamber and electrically connected in series. The semiconductor elements are individually mounted in spaced relation on a plate of an electrically insulating material which is a good conductor of heat and are electrically connected between a metal body secured to one side of the plate and a metal cover secured to the other side of the plate.

3,619,735

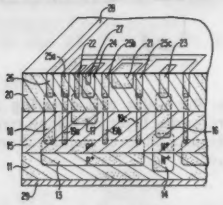
INTEGRATED CIRCUIT WITH BURIED DECOUPLING CAPACITOR

Charles Y. Chen, Putnam Valley; Vir A. Dhaka, Hopewell Junction, and Walter F. Krolikowski, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,453
Int. Cl. H01l 19/00
U.S. Cl. 317—235 9 Claims

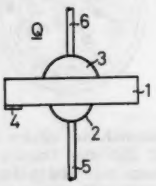
An integrated circuit and process for making it wherein a decoupling capacitor is provided beneath devices in the surface of the integrated circuit by the formation of a first epitaxial layer between an N^+ substrate having a P^+ zone diffused therein and an N^1 device-containing epitaxial layer. A

P^+ channel diffusion to the P^+ zone formed in the substrate will serve as a damping resistor in combination with the coupling capacitor. The process for forming such a decoupling capacitor in an integrated circuit comprises, inter alia, diffusing P^+ impurities into the substrate to form a large junction which will subsequently function as a decoupling capacitor. A first intrinsic, P^1 or N^1 epitaxial layer is then grown on the semiconductor substrate. Subsequently, an N^1 epitaxial layer is grown on the first epitaxial layer. A P^+



channel is then driven through the N^1 epitaxial layer and the first epitaxial layer to contact the P^+ diffused zone w hich serves as the decoupling capacitor. This P^+ channel diffusion will serve as a damping resistor in combination with the decoupling capacitor. Device diffusion, i.e., transistors, resistors, etc., will take place into the N^1 epitaxial layer, and during growth of the epitaxial layers the P^+ zone will significantly outdiffuse into the first epitaxial layer. Appropriate channels, isolations and contacts are also provided.

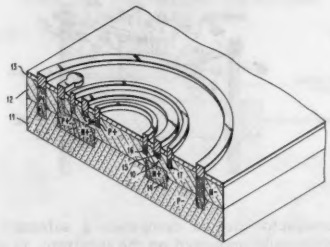
3,619,736
ALLOY JUNCTION TRANSISTOR AND A METHOD OF MAKING THE SAME
Takeo Miyata, Atsugi, Japan, assignor to Mitsumi Electric Company, Limited, Tokyo, Japan
Filed June 22, 1970, Ser. No. 48,018
Int. Cl. H01l *3/12, 7/34*
U.S. Cl. 317—235 **3 Claims**



An alloy junction transistor in which an indium dot serving as an emitter impurity and an indium antimony alloy dot containing 1 to 0.01 percent by weight of antimony relative to indium and serving as a collector impurity are alloyed with an N-type germanium wafer serving as the base to form emitter and collector junctions and the base grounded current amplification factor (emitter-collector current amplification factor) is greater than 1.

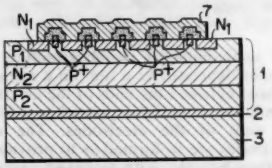
A method of making an alloy junction transistor having a base grounded current amplification factor exceeding 1 comprising the steps of alloying the indium dot and the indium-antimony dot with the N-type germanium wafer to form emitter and collector junctions therebetween, in which the heating temperature for alloying the indium-antimony alloy dot with the wafer is controlled such that it is relatively rapidly raised up to a value high enough to cause the contact portion of the wafer and the alloy dot to be liquid-phase and is held at this value for a predetermined time, thereafter being gradually lowered in accordance with an upwardly convex temperature curve or upwardly convex polygonal line.

3,619,737
PLANAR JUNCTION-GATE FIELD-EFFECT TRANSISTORS
Te-Long Chiu, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 8, 1970, Ser. No. 35,785
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R **10 Claims**



A junction-gate field-effect transistor is provided with its channel extending from the source to the drain in a direction normal to the plane of the substrate. The length of the channel is thereby substantially shorter than where the channel extends parallel to the plane of the substrate. The shorter channel provides faster switching speed and increased transconductance of the transistor.

3,619,738
SEMICONDUCTOR DEVICE WITH IMPROVED CONNECTION TO CONTROL ELECTRODE REGION
Michio Otsuka, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 12, 1970, Ser. No. 80,110
Claims priority, application Japan, Oct. 13, 1969, 44/81156, Nov. 7, 1969, 44/88695, Nov. 22, 1969, 44/93364
Int. Cl. H01l *5/02*
U.S. Cl. 317—235 **8 Claims**

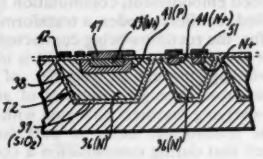


In a semiconductor device with a control grid and comprising at least three semiconductor layers of alternately different conductivity types, portions of the second layer are protruded through the first layer to be exposed on the surface of the first layer, second electrode is mounted on the exposed portions in ohmic contact therewith, a third electrode is mounted to insulating cover the second electrode and the exposed portions containing the same, and the third electrode is in ohmic contact with the first layer.

3,619,739
BULK RESISTOR AND INTEGRATED CIRCUIT USING THE SAME
Hans R. Camenzind, and David F. Allison, both of Los Altos, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.
Filed Jan. 16, 1969, Ser. No. 791,660
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **4 Claims**

Bulk resistor formed in a semiconductor body by the use of dielectric isolation which forms an isolated island and in

which contact elements are provided at two spaced points to provide a predetermined resistance. The bulk resistor is of a



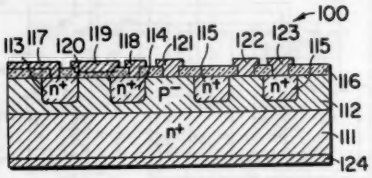
type which can be readily incorporated into an integrated circuit.

3,619,740

INTEGRATED CIRCUIT HAVING COMPLEMENTARY FIELD EFFECT TRANSISTORS

Sho Nakanuma; Yuichi Haneta, and Toshio Wada, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 28, 1969, Ser. No. 871,826
Claims priority, application Japan, Oct. 29, 1968, 43/79173
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 5 Claims



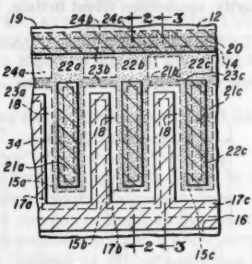
An integrated circuit is disclosed in which the drain and source regions of an integrated gate-type field-effect transistor and the gate region of a junction-type field-effect transistor are formed in common within a semiconductor layer of one conductivity type formed on a substrate of the opposite conductivity type.

3,619,741

METHOD OF PROVIDING INTEGRATED DIFFUSED EMITTER BALLAST RESISTORS FOR IMPROVED POWER CAPABILITIES OF SEMICONDUCTOR DEVICES

Ian Hambry Morgan, Eaton Socon, St. Neots, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1969, Ser. No. 879,119
Int. Cl. H01l 11/06
U.S. Cl. 317—235 R 7 Claims



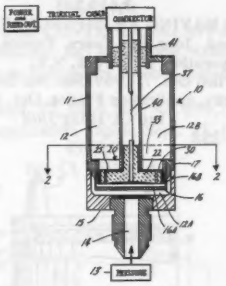
The disclosure is directed to planar transistors which include an emitter region disposed in a base region, the emitter region comprising an elongated spine from which spaced parallel emitter stripes project. The emitter electrode comprises a spine contact and individual electrode strips extending from the distal ends of the emitter fingers to locations spaced apart from the spine contact leaving discontinuities in the emitter electrode such that the sheet resistance of the emitter fingers underlying the discontinuities is utilized to form electrical ballast resistances in the emitter contact sufficient to prevent localized thermal runaway during operation of the transistor. The base contact has contact strips interdigitating with the emitter contact strips and extending from a common base electrode portion. Adjacent the discontinuities in the emitter contact, webs of emitter region material extend across the ends of the base contact strips and join adjacent ones of the emitter fingers to prevent deleterious localized current injection during operation of the transistor. An embodiment is also described in which the emitter region does not have a spine but consists of a series of spaced-apart, parallel extending fingers.

3,619,742

SHIELDED CAPACITANCE PRESSURE SENSOR

Stanley E. Rud, Jr., Hopkins, Minn., assignor to Rosemount Engineering Company, Eden Prairie, Minn.

Filed May 21, 1970, Ser. No. 39,336
Int. Cl. H01g 7/00
U.S. Cl. 317—246 19 Claims



A capacitance-type pressure sensor having a reference capacitor plate and embodying a shield surrounding the lead wire and reference plate support assembly and maintained at substantially the same potential as the lead wire and reference plate. The shield extends substantially coplanar with the reference capacitor plate so that errors due to shunt capacitances are eliminated.

3,619,743

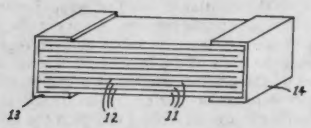
IMPREGNATED CAPACITOR WITH ALL-FILM DIELECTRICS AND AT LEAST ONE FOIL ELECTRODE HAVING A CHEMICALLY PRODUCED PATTERN OF PASSAGES FOR PROMOTING IMPREGNATION

Joseph F. Ferrante, Dover, Mass., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.

Filed Jan. 26, 1970, Ser. No. 005,661
Int. Cl. H01g 3/21
U.S. Cl. 317—258 10 Claims

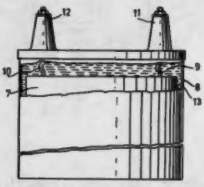
Impregnated capacitors having all-film dielectrics utilize one or more foil electrodes whose surfaces are etched or coeered with a porous oxide to provide entry passages for impregnating liquid. The passages are too fine for the film to fill before or during the impregnation process.

3,619,744
MONOLITHIC CAPACITORS
Budd James Stephenson, Niagara Falls, N.Y., assignor to National Lead Company, New York, N.Y.
Filed Mar. 2, 1970, Ser. No. 15,464
Int. Cl. H01g 1/01
U.S. Cl. 317—258 3 Claims



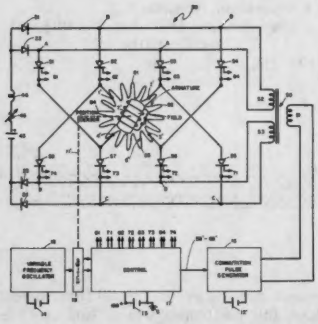
A low-cost monolithic capacitor having a high resistance to capacity change over the temperature range from −50° to 130° C. comprises superimposed alternate layers of a fired ceramic dielectric composition containing from about 93 mol % to about 96 mol % $BaTiO_3$, from about 2.5 mol % to about 4.75 mol % $PbBi_4Ti_4O_{15}$ and from about 1.0 mol % to about 2.25 mol % of an additive selected from the group $BaO{\cdot}Nb_2O_5$, $BaO{\cdot}Ta_2O_5$, $PbO{\cdot}Nb_2O_5$ and $PbO{\cdot}Ta_2O_5$, and electrodes containing up to about 90% palladium, the remainder being gold and/or platinum.

3,619,745
CAPACITOR HAVING AN IMPREGNATED DIELECTRIC
Michel Perigord, Joue Les Tours, France, assignor to U. S. Philips Corporation, New York, N.Y.
Filed Oct. 7, 1969, Ser. No. 864,538
Claims priority, application France, Oct. 10, 1968, 169422
Int. Cl. H01g 3/04
U.S. Cl. 317—258 2 Claims



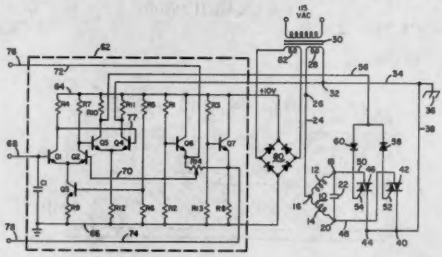
A capacitor having a dielectric impregnated with a nonthermohardening epoxy resin.

3,619,746
ELECTRONIC COMMUTATION SYSTEM FOR MOTORS
Richard D. Thornton, Concord, and William S. Brown, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed July 25, 1969, Ser. No. 844,947
Int. Cl. H02k 29/00
U.S. Cl. 318—138 16 Claims



An electronic motor to connect to a DC power source and to provide a variable speed or a controllable fixed speed motor. There is disclosed a novel arrangement for effecting commutation of current in the armature windings of the motor. Commutation is initiated by signals from a variable frequency generator or from a position sensor. In either case, in the described embodiment, commutation is effected by silicon-controlled rectifiers, diodes, a transformer and drive circuitry therefor, the rectifiers being connected serially in pairs to the motor armature such that current is introduced to the armature winding through a rectifier of one pair and removed therefrom through a rectifier of another pair, the two current-carrying rectifiers changing with each commutation and the transformer being in part connected to the rectifiers such that during commutation a commutating voltage from the transformer is introduced through four rectifiers to the two armature coils undergoing commutation.

3,619,747
ELECTRONIC MOTOR CONTROL CIRCUIT EMPLOYING TRIACS
Daryl R. Pedersen, Wayzata, Minn., assignor to Novatron, Inc., St. Paul, Minn.
Filed Jan. 19, 1970, Ser. No. 3,640
Int. Cl. H02p 3/20
U.S. Cl. 318—202 1 Claim

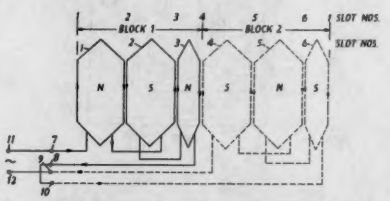


A motor control circuit for controlling the direction of rotation of a reversible alternating current motor wherein a pair of symmetrical silicon negative resistance switches, commonly known as triacs, are used to control the excitation of such motor, the firing of the triacs, in turn, being controlled by the output of a transistor difference amplifier.

ERRATUM

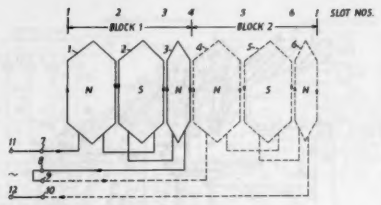
For Class 318—224 R see:
Patent No. 3,619,730

3,619,748
TWO-SPEED, SINGLE-PHASE ELECTRIC MOTORS
John F. Eastham, Long Ditton, England, assignor to National Research Development Corporation, London, England
Filed Sept. 24, 1969, Ser. No. 860,744
Claims priority, application Great Britain, Oct. 2, 1968, 46,789/68
Int. Cl. H02k 17/14, 17/16
U.S. Cl. 318—224 R 9 Claims



A close ratio, two-speed, pole-changing single-phase electric motor having a stator winding tapped and connected for

pole-changing by the so-called phase-mixing or step-phase modulation technique and including means for providing



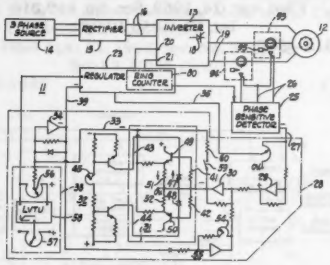
starting torque comprising, preferably, shading rings or gap variation at every pole.

3,619,749

MOTOR CURRENT CONTROL CIRCUIT UTILIZING REAL CURRENT COMPONENT

Robert G. Schieman, Cleveland Heights, Ohio, assignor to Reliance Electric Company

Filed Oct. 6, 1969, Ser. No. 863,922
Int. Cl. H02p *5/40*
U.S. Cl. 318—231 **15 Claims**



A control circuit obtains a signal proportional to current supplied to an induction motor from a variable-frequency inverter. A phase-sensitive detector discriminates between the real and reactive components of the motor current and the real component is fed back to control the current to the motor, preferably in a current limit circuit which limits the torque output of the motor. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

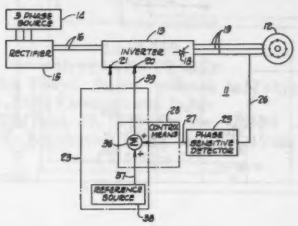
3,619,750

SPEED COMPENSATION MOTOR CIRCUIT UTILIZING REAL CURRENT COMPONENT

Boris Mokrytzki, Highland Heights, and Peter W. Hammond, Chagrin Falls, both of Ohio, assignors to Reliance Electric Company

Filed Oct. 6, 1969, Ser. No. 863,946
Int. Cl. H02p *5/40*
U.S. Cl. 318—231 **12 Claims**

An induction motor energization circuit id disclosed with energization from a variable frequency device such as an inverter. The load current to the induction motor has a considerable lagging power factor and a phase-sensitive detector detects only the in-phase or 180° out-of-phase component of this load current and applies it as a control to regulate the variable frequency device. The typical induction motor action is one where the speed droops because the slip increases as the torque increases and may be 2 to 3 percent of base speed. A signal such as the in-phase component of load current which is virtually proportional to torque is used in this invention to correct the frequency output of the inverter by 2 or 3 percent, therefore virtually eliminating the speed or slip error. By the present invention the use of only the real component of the motor load current as a feedback signal results



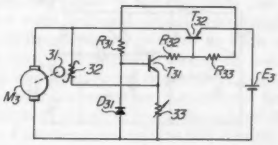
in a substantially constant speed of the motor. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,619,751

MOTOR SPEED CONTROLLING APPARATUS

Kaoru Sasabe, Ikeda-shi, and Fujio Oda, Ashiya-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 22, 1969, Ser. No. 859,724
Claims priority, application Japan, Sept. 27, 1968, 43/70673, 43/70674
Int. Cl. H02p *5/08*
U.S. Cl. 318—325 **2 Claims**



An apparatus for controlling the speed of an electric motor, wherein use is made of an element sensitive to a pressure, the electrical resistance of said element or a voltage developed thereacross being varied in accordance with the pressure imparted thereto, and a centrifugal force produced by a rotary member is imparted to said sensitive element so that the speed of said electric motor is controlled in accordance with variations in the electrical resistance of said sensitive element.

3,619,752

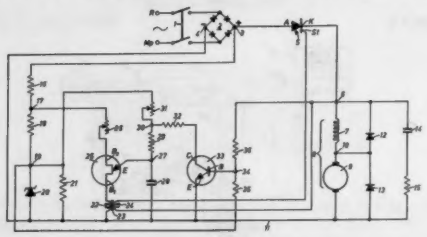
PULSATING CURRENT CONTROL SYSTEM FOR SERIES MOTORS AND THE LIKE USING A CONTROLLED RECTIFIER

Gediminas Bateika, Grotzingen, Baden-Wurttemberg, Germany, assignor to G.M. Pfaff AG, Kaiserslautern, Pfalz, Germany

Filed Jan. 24, 1969, Ser. No. 793,719
Claims priority, application Germany, June 1, 1968, P 17 63 460.5
Int. Cl. H02p *5/16*
U.S. Cl. 318—331 **6 Claims**

In a series-wound motor speed control system comprising a solid state controlled rectifier connected in series with the motor and a source of pulsating rectified current, the rectifier is controlled by a synchronized unijunction transistor triggering pulse former including an RC timing network. The time position of the triggering pulses is subject to a threefold

control, namely, a manual control, by varying the resistance of the network, to adjust the motor speed, a first automatic control in dependence upon variations of the motor load, and



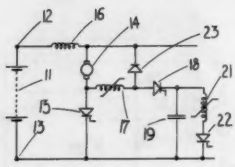
a second automatic control depending upon supply voltage variations, to maintain the adjusted motor speed constant independently of said variations.

3,619,753

THYRISTOR CIRCUITS

Michael Ainley Thompson, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 10, 1969, Ser. No. 840,675
Claims priority, application Great Britain, Dec. 23, 1968, 60989/68
Int. Cl. H02m *7/52*
U.S. Cl. 318—345 **1 Claim**



A thyristor circuit has an inductive load and a first thyristor connected in series across a DC source. Connected across the first thyristor is an inductor, a second thyristor and a capacitor, and means is provided for reversing the charge on the capacitor at a convenient time so that the charge on the capacitor can be used to turn off the first thyristor. A diode is connected across the series combination of inductive load and inductor.

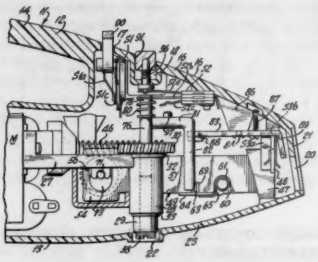
3,619,754

MULTIFUNCTIONAL ELECTRIC HOME APPLIANCE

Nathan Fuchs, Brooklyn, N.Y., assignor to Van Wyck International Corporation, New York, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,486
Int. Cl. H02p *1/00*
U.S. Cl. 318—445 **11 Claims**

An electrical mixer and knife combination appliance includes a pair of rotary chucks for releasably engaging mixer member shanks and a pair of oppositely reciprocating coupling channels for releasably engaging corresponding knife blade shanks, a motor, and transmissions connecting the motor to the chucks and coupling channels respectively to rotate and reciprocate these. Ejector slide rods register with the chucks and a gate is movable across the front of the channels and these are interconnected so as to be alternatively advanced to positions preventing the engagement of implements by the chucks or channel members. The drive motor is connected to a current source through a first manual switch in series with a switch closed by retraction of the slide rods



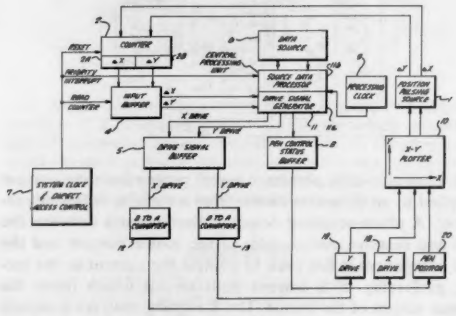
and through a second manual switch in series with a switch closed with retraction of the gate.

3,619,755

DIGITAL DRAFTING CONTROL SYSTEM

Ronald Verlin Munro, Woodland Hills; Stephen R. Seccombe, Northridge, and Cesar Baray, Los Angeles, all of Calif., assignors to Computer Industries, Inc., Sherman Oaks, Calif.

Filed Apr. 24, 1969, Ser. No. 819,016
Int. Cl. G05b *19/28*
U.S. Cl. 318—568 **17 Claims**



A digital drafting control system adapted to control an X-Y precision plotter is disclosed. The system is responsive to digital input data defining the end coordinates of a plurality of straight line segments. The straight line segments define the graphic display desired. The control system selectively senses the position of the drawing pen and generates drive signals to X-drive and Y-drive motors associated with the X-Y plotter. The X-drive and Y-drive motors optimally drive the drafting pen in a rectilinear manner to each successive end point coordinate defined by the digital data source.

3,619,756

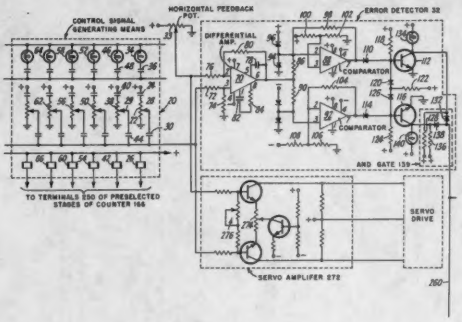
SERVO DRIVE PROGRAM CONTROL

Ernest M. Rossini, Bronxville, N.Y., and Edgar R. Lodi, York, Pa., assignors to AMF Incorporated

Filed July 18, 1969, Ser. No. 843,013
Claims priority, application Great Britain, Aug. 22, 1968, 40,207/68
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **19 Claims**

In this invention, a servo drive coupled to drive a member such as an articulated arm along a desired path is controlled (programmed) by a counter which sequentially selectively

couples signal generating means such as impedances to the servo drive, where each impedance generates a signal which

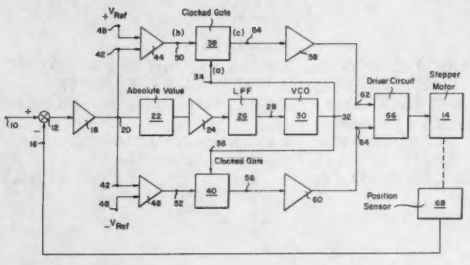


is representative of a discrete physical displacement, of the servo drive.

3,619,757
VARIABLE SPEED CLOSED LOOP DIGITAL SERVOSYSTEM

Steven R. Ioerger, North Hollywood; Dun H. Nelson, Jr., Sunland, and Irvin M. Starr, Granada Hills, all of Calif., assignors to The Bendix Corporation

Filed Apr. 22, 1969, Ser. No. 818,350
Int. Cl. G05b *19/40*
U.S. Cl. 318—685 **5 Claims**

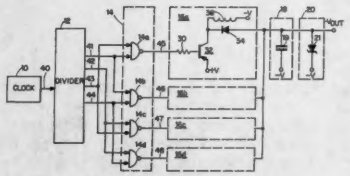


An analog, condition responsive, bidirectional stepper motor position servosystem in which the rate of response is a function of the absolute value of the instantaneous error signal. Clocked gates are utilized in lieu of AND gates to prevent the application of excessive pulses from the VCO to the motor and step integrity is insured by the utilization of a filter circuit at the input to the VCO.

3,619,758
DC VOLTAGE CONVERSION APPARATUS

Minas Deranian, Sudbury, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1970, Ser. No. 76,397
Int. Cl. H02m *3/22*
U.S. Cl. 321—2 **10 Claims**

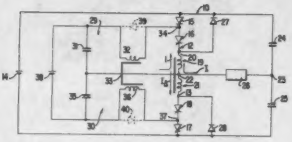


A plurality of DC to DC converter circuits are coupled to respond to pulses occurring at substantially different points in time, each circuit producing a high level DC voltage from a low level DC voltage. The high level DC voltage from each of the converter circuits are coupled to a filter which provides a transient free waveform at an output terminal. The duty cycle provided for each of the converter circuits allows minimal size components to be used while obtaining a high power output.

3,619,759
INVERTER DEVICE

Nagataka Seki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co, Ltd., Kawasaki-shi, Japan

Filed Sept. 28, 1970, Ser. No. 76,194
Claims priority, application Japan, Sept. 29, 1969, 44/77053
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 C **6 Claims**

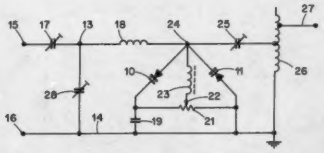


A bridge type inverter which has two arms connected in series across a DC power supply. Each of the arms respectively includes first and second thyristor units which are serially connected with the same polarities. A load is provided and is connected between a common connecting point of the arms and an electrically neutral point. The second thyristor units of the two arms are located at positions adjacent to the common connecting point of the two arms and are respectively provided with first and second commutation circuits which are electromagnetically coupled to each other. When it is desired to turn off a presently turned on arm, it is necessary to turn on only the second thyristor unit of the other off arm. At such time, commutation current will flow from the second commutation circuit through the second thyristor unit of the off arm. Commutation current will thereby be induced in the first commutation circuit to turn off the arm which was turned on. In a similar manner the other arm when conducting can be turned off.

3,619,760
ELECTRONIC WAVE FREQUENCY MULTIPLIER WITH VARACTORS HAVING GAMMA ABOUT 0.56

Digjut Singh, and Eugene S. Lysak, both of Waltham, Mass., assignors to Bell & Howell Communications Company, Waltham, Mass.

Filed May 15, 1970, Ser. No. 37,666
Int. Cl. H02m *5/20*
U.S. Cl. 321—69 NL **10 Claims**



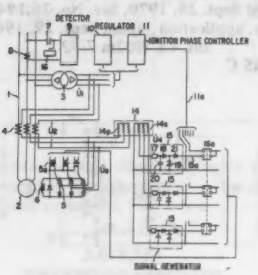
A pair of varactors connected antiparallel across a source of fundamental frequency power to provide third harmonic power with essentially suppressed even harmonics minimizes the fifth harmonic with varactors having gamma about 0.56.

3,619,761

EXCITATION CONTROL DEVICE OF SELF-EXCITING, COMPOUND SYNCHRONOUS MACHINE

Masaomi Nagae, and Sumio Yokokawa, both of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Mar. 10, 1970, Ser. No. 18,102
Claims priority, application Japan, Mar. 13, 1969, 44/18986
Int. Cl. H02p 9/30, 9/10
U.S. Cl. 322—25 9 Claims



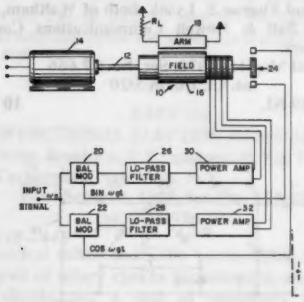
An excitation control device of a self-exciting, compound synchronous machine, particularly a synchronous generator, excited by way of a rectifying device including at least one thyristor, which device includes a stable ignition signal source for the thyristor of the rectifying device and is capable of supplying an exciting current even when a short circuit failure occurs in a system connected to the synchronous machine. By this device, a generator can continue to supply a short circuit current, whereby the operation of an overcurrent relay and resynchronization with the system without undue conditions at the time of recovery from the failure are assured.

3,619,762

FREQUENCY RESPONSIVE ROTARY LINEAR AMPLIFIER FOR ALTERNATORS

Billy D. Pitchard, Springfield, Va., assignor to The Technical Material Corporation

Filed Jan. 2, 1970, Ser. No. 34
Int. Cl. H02p 9/30, 9/42
U.S. Cl. 322—31 8 Claims



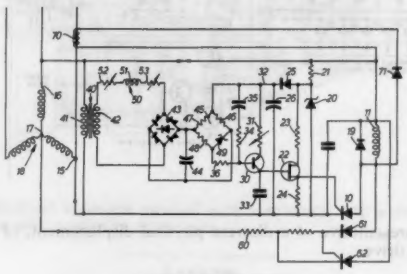
Output signals from high-frequency alternators are stabilized by a quadrature mixing process. A plurality of modulating signals are applied to the fields of an alternator in such a fashion as to cause the field flux to either rotate with or against the mechanical rotation of the rotor; the field modulating signals having a predetermined phase relationship and a frequency identical to the difference between the generated signal frequency and the desired output frequency.

3,619,763

FREQUENCY-RESPONSIVE CONTROL APPARATUS FOR ELECTRIC ALTERNATORS

Peter J. Wyles, Stamford, England, assignor to Newage Lyon Limited, Stamford, England

Filed July 19, 1968, Ser. No. 746,140
Int. Cl. H02p 9/30
U.S. Cl. 322—32 4 Claims



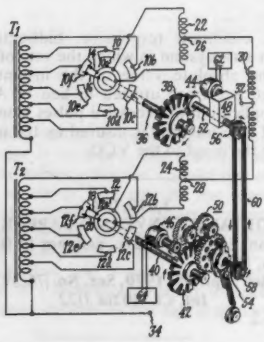
In automatic regulating apparatus for an electric alternator a main thyristor is connected in series with an excitation winding across the alternator terminals and is controlled by a sensing circuit to which a signal corresponding to alternator output voltage is passed through an inductor to give frequency-responsive control.

3,619,764

PARALLEL CONNECTED TAP CHANGERS EMPLOYING SIMULTANEOUSLY MOVABLE CONTACTS

Robert H. Brennan, Pittsfield, Mass., assignor to General Electric Company

Filed Mar. 19, 1970, Ser. No. 21,107
Int. Cl. H02p 13/06; G05f 1/14
U.S. Cl. 323—43.5 R 4 Claims



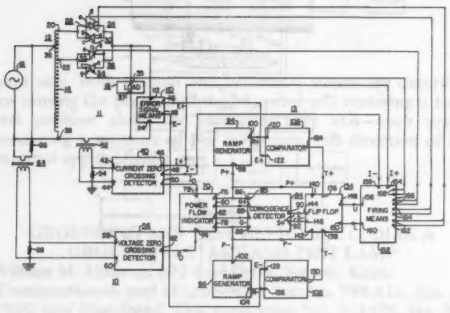
A pair of mechanical tap changers supply current to a load from pairs of transformer taps having like voltages. Corresponding stationary contacts of the tap changers are simultaneously coupled to transformer taps having identical voltages, and current is supplied to the load from the center tap of a limiting reactor connected between the output terminals of the tap changers. Actuation of the tap changers is synchronized by means of a chain drive coupling the movable elements of the tap changers.

3,619,765

ELECTRICAL CONTROL APPARATUS USING DIRECTION OF CURRENT AND POWER FLOW TO GATE SWITCHING DEVICES

Peter Wood, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1970, Ser. No. 49,318
Int. Cl. G05f 1/20
U.S. Cl. 323—43.5 S 19 Claims



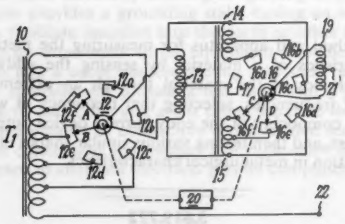
Electrical control apparatus including a transformer having a winding connectable in a power circuit which includes a source of alternating potential and a load circuit. The transformer winding includes at least two tap connections which are selectively connected into the power circuit with solid-state switching devices. The solid-state switching devices are gated at a firing angle responsive to an error signal. Tap-to-tap short circuits are obviated, regardless of the type of connected load, by firing control which senses the direction of instantaneous power flow, and the direction of instantaneous current flow in the power circuit.

3,619,766

VERNIER VOLTAGE REGULATOR

James W. Simpson, Pittsfield, Mass., assignor to General Electric Company

Filed June 25, 1970, Ser. No. 49,709
Int. Cl. H02p 13/06; G05f 1/14
U.S. Cl. 323—43.5 R 7 Claims



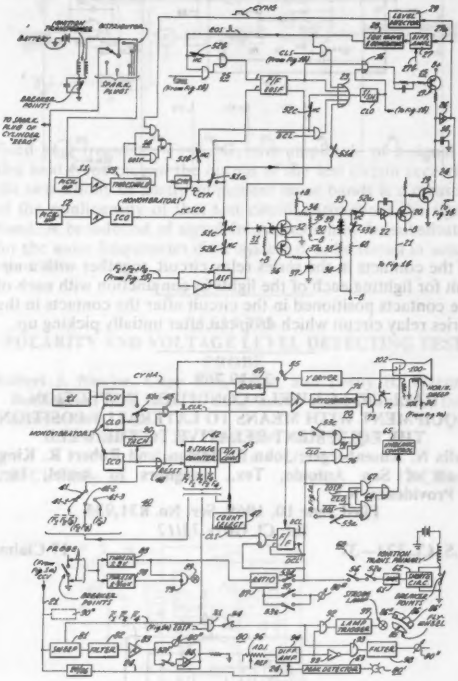
A split, tapped transformer winding and a current limiting reactor are connected between the two movable fingers of a conventional tap changer. Contacts of a second tap changer are coupled to the taps of the split transformer winding and to the center tap of the equalizing reactor, and engaged by two movable fingers for providing a vernier adjustment of output voltage.

3,619,767

SYSTEM FOR TESTING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Edmond R. Pelta, 567 Erskine Drive, Pacific Palisades, Calif., and Kenneth Stewart Gold, 7721 Nevada Ave., Canoga Park, Calif.

Filed June 10, 1966, Ser. No. 556,710
Int. Cl. F02p 17/00
U.S. Cl. 324—17 9 Claims



When a first cylinder in a multicylinder engine is fired, it triggers an oscilloscope sweep which produces a linearly rising voltage representing the sweep. When the voltage rises to a particular level, the sweep is discontinued and a new sweep is not initiated until the first cylinder is triggered in the next cycle of firings in the multicylinder engine. By providing this arrangement, the slope of the sweep is changed as the speed of the engine changes. This causes a substantially constant ratio of time to be produced in each cycle between the duration of the sweep and the time remaining until the initiation of the next sweep.

A particular cylinder in the engine is tested in each cycle of engine firing. The testing occurs when the sweep voltage reaches a particular value dependent upon the relationship between the first cylinder and the particular cylinder.

3,619,768

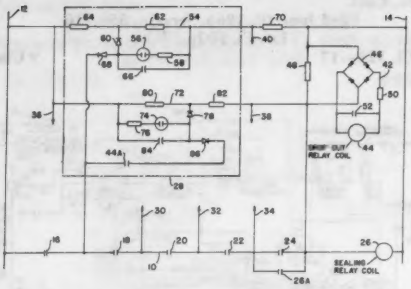
APPARATUS FOR DETERMINING THE LOCATION OF A FAILURE IN A SERIES RELAY CIRCUIT AND THE TYPE OF FAILURE

Robert B. Harte, Taylor, Mich., assignor to Buhr Machine Tool Corporation

Filed Apr. 15, 1968, Ser. No. 721,388
Int. Cl. G01r 31/02
U.S. Cl. 324—28 4 Claims

Structure for and a method of analyzing failure of a series relay circuit is disclosed. The location of the failure of the circuit may be determined with the structure and by the method disclosed as well as the type of failure occuring. Thus, in a series relay circuit, lights are provided in conjunction with each of the contacts in the circuit and a circuit is provided associated therewith to for turning an the lights on

as the relay contacts pick up and for maintaining the lights in an on condition, even though the circuit may subsequently be broken. A second light is provided in conjunction with each



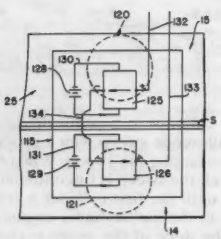
of the contacts in the series relay circuit, together with a circuit for lighting each of the lights in conjunction with each of the contacts positioned in the circuit after the contacts in the series relay circuit which drop out after initially picking up.

3,619,769

HALL EFFECT WELD CONDITION INSPECTION EQUIPMENT WITH MEANS TO LATERALLY POSITION THE EQUIPMENT RELATIVE TO THE WELD

Felix N. Kusenberger; John R. Barton, and Robert R. King, all of San Antonio, Tex., assignors to Amtel, Inc., Providence, R.I.

Filed June 10, 1969, Ser. No. 831,935
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **17 Claims**



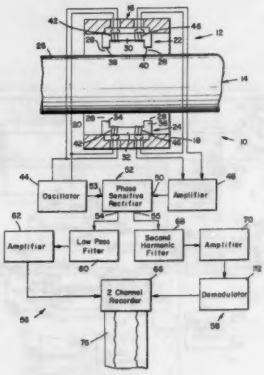
A longitudinally welded ferrous bimetal strip passes continuously at production speed from a welding machine successively through safety head and inspection head units, in the latter of which the strip is magnetized and electromagnetically monitored by an inspection probe for the purpose of detecting magnetic perturbations occasioned by leakage of flux, such as might be caused by various conditions of the weld zone as monitored by the probe. The latter operates under the principle of the Hall effect. The signal from the inspection probe is built-up and fed through signal processing circuitry, then imposed on indicating meter equipment of a readout monitor unit located adjacent the welding machine, where an attendant may make any needed adjustment as indicated at the monitor unit. The safety head unit protects the inspection probe head unit by removing surface accumulation on the strip apt to damage the probe of the inspection head, and by detecting major flaws in the weld, lifting the probe to a safe position to avoid such damage by a flaw. The safety and inspection head units are mechanically similar in many respects and have provisions for a proper lateral positional relationship between the longitudinal weld zone and detecting components of the safety and inspection units.

3,619,770

EDDY CURRENT TEST SYSTEM FOR INDICATING THE OVAL SHAPE OF A CYLINDRICAL WORKPIECE

Friedrich M. O. Forster, Der Schoene Weg 144, 7410 Reutlingen, Germany

Filed Mar. 2, 1970, Ser. No. 15,524
Int. Cl. G01r *33/00*
U.S. Cl. 324—40 **2 Claims**



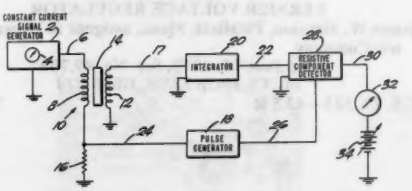
An eddy current system is disclosed herein for inspecting pipes, bars, wire, etc., measuring the diameter and the ovality thereof. The system includes a search unit having a probe which spins around the pipe and generates a signal which is a function of the spacing between the pipe and probe.

3,619,771

METHOD OF AN APPARATUS FOR SELECTING THE OPTIMUM TEST FREQUENCY IN EDDY CURRENT TESTING

Rudolf G. Hentschel, 2002 Wayne, Ann Arbor, Mich.

Filed Sept. 2, 1969, Ser. No. 854,613
Int. Cl. G01r *33/14*
U.S. Cl. 324—40 **11 Claims**



A method and apparatus for measuring the metallurgical characteristics of a material by sensing the eddy current characteristics of the material through an extremely wide range of frequencies, selecting that frequency at which the resistive component of the eddy current device output signal is greatest, and then testing various similar shapes of material for variation in metallurgical characteristics.

3,619,772

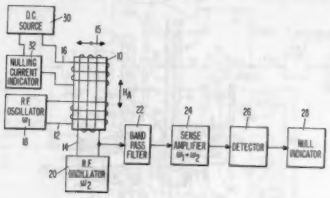
MAGNETOMETER EMPLOYING MEANS RESPONSIVE TO VARIATIONS OF MAGNETIZATION VECTOR POSITION IN A THIN FILM SENSOR

David M. Ellis, South Burlington, Vt., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 29, 1969, Ser. No. 854,197
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **20 Claims**

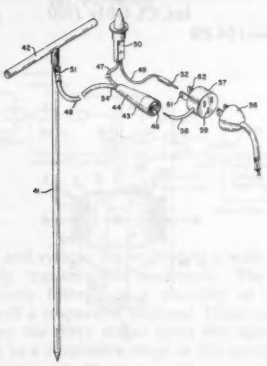
A thin magnetic film magnetometer is described in which the thin film sensor element is driven in both its easy and hard axes directions by oscillators having different frequen-

cies. The nature of the signal appearing on a winding coupled to the thin film along its easy direction depends upon the angular position of the thin film magnetic moment or magnetization (M) vector and the film easy axis; which in turn is a function of an external field applied to the film along its



hard axis. Both manual and automatic means are described for sensing the position of the M vector and restoring it to its rest position along the thin film easy axis—such action producing a measure of the magnitude and direction of the external applied field.

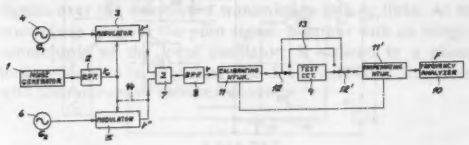
3,619,773
GROUNDING AND TEST DEVICE INCLUDING A GROUNDING STAKE AND TEST LAMP
William M. Lathrop, 602 Pool Drive, Norton, Kans.
Continuation-in-part of application Ser. No. 789,831, Jan. 8, 1969, now abandoned. This application Jan. 6, 1970, Ser. No. 000,926
Int. Cl. G01r *31/02, 19/16*
U.S. Cl. 324—51 **2 Claims**



An electrical grounding device for use at "on-site" locations to protect mobile equipment and personnel from the hazards of static electricity discharges, lightning or stray currents which provides a grounding stake having an insulated handle to facilitate insertion into the earth or other receptacle, a clip for attachment to the equipment or vehicle to be protected, and a cable interconnecting said stake and clip. Alternate embodiments provide a test lamp with a terminal connected to said cable and a test prong separate therefrom whereby the polarity of connectors is determined for proper equipment connection and useage. The cable itself may also be connected to alternate electrical ground components.

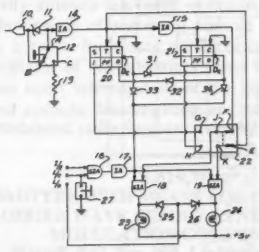
3,619,774
SYSTEM FOR MEASURING NONLINEARITY OF A SIGNAL-TRANSMITTING NETWORK
Franz Josef Landwehr, Munster, Germany, assignor to Wandel & Goltermann, Reutlingen, Germany
Filed July 29, 1969, Ser. No. 845,738
Claims priority, application Austria, July 30, 1968, A 7430/68
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 DE **8 Claims**

The output of a random-noise generator is modulated with the aid of two fixed reference frequencies G_1, G_2 (one of which may be zero) to yield two mutually transposed but correlated noise bands overlapping in a frequency range which substantially coincides with a band of signal frequencies to be transmitted through a test circuit to be examined for nonlinearity. With the sum or difference of any two correlated signal frequencies f_i', f_i'' in the two noise bands equal to a



fixed beat frequency $F=G_2\pm G_1$, the amplitude of a signal of this beat frequency in the output of the test circuit receiving the two wholly or partly coincident noise bands is a measure of the nonlinearity of that test circuit throughout the signal band. A broadband of signal frequencies may be substituted for the noise frequencies if the system is to be tested in actual operation.

3,619,775
POLARITY AND VOLTAGE LEVEL DETECTING TEST PROBE
Robert J. Naylor, Cape May Point, and Leroy H. Werner, Burlington, both of N.J., assignors to Pulse Monitors, Inc., Moorestown, N.J.
Filed Nov. 25, 1969, Ser. No. 879,865
Int. Cl. G01n *15/12*
U.S. Cl. 324—73 **13 Claims**

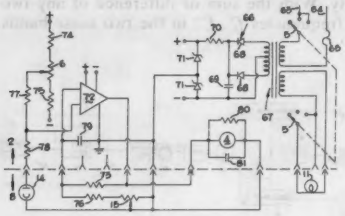


An electrical test instrument for use in servicing digital computers which provides a digital output by means of two lamps indicating the characteristics of a voltage level or pulse or train of pulses at a point in the computer. The instrument comprises a test probe connected through a selectively inserted zener diode to a pair of cascaded amplifiers each of which drives a gating circuit and a control circuit for providing a conditioning signal to the gates. The gate circuits in turn control the indicating lamps. A pair of flip-flops may be selectively placed in the circuit between the amplifiers and the gates when the test instrument is used to indicate statically the condition of the first pulse received by the probe.

3,619,776
MULTIFUNCTION INSTRUMENT INCLUDING PLUG-IN MODULES HAVING AMPLIFIER RESPONSE CONTROL ELEMENTS
Warren G. Kinninger, 6 Cornflower, St. Louis, Mo.
Filed June 9, 1969, Ser. No. 831,355
Int. Cl. G01r *15/08, 1/30*
U.S. Cl. 324—115 **1 Claim**

The present invention relates to a multifunction instrument in which the measurement of such quantities as conductivity, oxygen uptake or evolution, temperature, pH and colorimetry is accomplished by utilizing an instrument, comprising a common unit and function modules which are removably mountable to said common unit wherein the com-

mon unit is provided primarily with those functional elements normally used in any laboratory instrument designed for measurement of quantities in the field of use contemplated



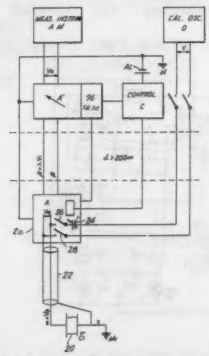
by the invention and the function modules are provided primarily with those elements normally associated with the measurement of a specific quantity.

3,619,777

PRECISION MEASURING NETWORK HAVING PRIMARY ELEMENTS OF HIGHLY CAPACITIVE IMPEDANCE

Jacques Terry, 14 Allee Diamont Foret de Vernon, 26 Vernon 6, France

Filed Mar. 17, 1969, Ser. No. 807,666
Claims priority, application France, Mar. 15, 1968, 143895
Int. Cl. G01r *7/00; G01r 35/04*
U.S. Cl. 324—140 R **3 Claims**



Precision measuring network including a plurality of piezoelectric detectors and associated circuits and a control and calibrating apparatus including a calibrating oscillator, a measuring instrument and a control. The circuits are connected to the detectors by calibrated cables. A calibration signal from the oscillator is applied to a capacitive voltage divider constituted by the detector and cables and stray capacitances. The circuits are packaged in sealed cylindrical housings.

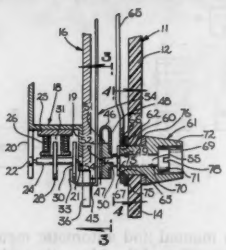
3,619,778

ADJUSTING DEVICE FOR AN ELECTRICAL MEASURING INSTRUMENT

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Feb. 4, 1970, Ser. No. 8,667
Int. Cl. G01r *1/00*
U.S. Cl. 342—154 R **2 Claims**

An adjusting device having a knob and an adjusting shaft which are concentric and accessible from the exterior of an electrical measuring instrument. The knob positions a preset pointer at a selected value on the scale of the instrument and the adjusting shaft independently locates a control magnet for zero adjustment of the instrument. The control magnet is rotatably retained in a U-shaped front wall of a bracket which is opposite the end of the adjusting shaft. The knob



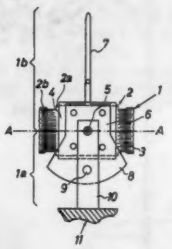
and adjusting shaft are mounted in a face panel of the instrument to be rotated independently of one another.

3,619,779

UNBALANCED COIL ASSEMBLY FOR MOVING-COIL INSTRUMENTS

Willy Kisselmann, Grunwald; Fritz Rumpelein, Guido-Schneble, and Paul Kopf, Unterhaching, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Mar. 26, 1969, Ser. No. 810,587
Claims priority, application Germany, Mar. 30, 1968, P 17 66 083.2
Int. Cl. G01r *1/00*
U.S. Cl. 324—154 PB **9 Claims**



An unbalanced coil assembly for use in moving-coil instruments comprises a frame which carries the coil, two coaxial staffs, a pointer and platelike balance weight. When the coil assembly is mounted for turning movement about the common axis of its staffs and when such axis is located in a horizontal plane, the balance weight is caused by gravity to move to a level below the staffs. This balance weight extends beyond the outline of the frame so that some of its material can be removed by one or more milling or like tools until the coil assembly is properly balanced.

3,619,780

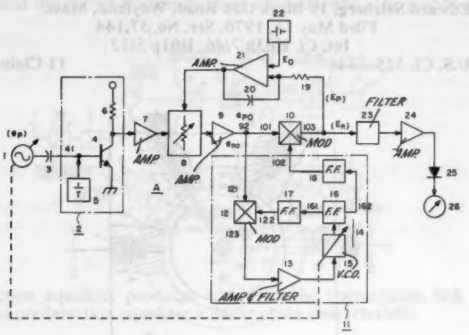
TRANSISTOR NOISE MEASURING APPARATUS

Bas Hoeks, Palo Alto; Paul E. Stoft, Menlo Park, Calif.; Nobuo Numasaki; Haruo Ito; Takayuki Sato, Tokyo, Japan, and Knud Knudsen, Los Altos Hills, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 2, 1970, Ser. No. 168
Claims priority, application Japan, Jan. 24, 1969, 44/04813
Int. Cl. G01r *31/22, 27/00*
U.S. Cl. 324—158 T **2 Claims**

An improved instrument measures noise power generated by a transistor under selected test conditions. Automatic ad-

justment of gain from the input of the transistor under test



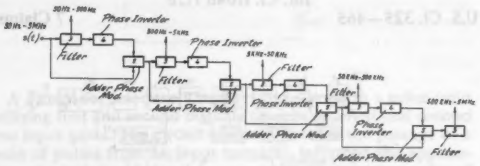
through succeeding stages provides an accurate readout of noise generated within the transistor under test.

3,619,781

SYSTEM FOR THE TRANSMISSION OF A RADIO-FREQUENCY SIGNAL WITH SEPARATION INTO INDIVIDUALLY TRANSMITTABLE SUBBANDS

George P. Cartianu, and Aurin A. G. Popea, both of Bucharest, Romania, assignors to Ministerul Industriei Constructiilor de Masini, Bucharest, Romania

Filed Dec. 30, 1968, Ser. No. 788,701
Claims priority, application Romania, Dec. 30, 1967, 55542
Int. Cl. H04b *7/14*
U.S. Cl. 325—1 **4 Claims**



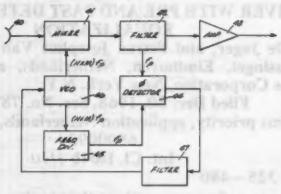
A method of and system for separating a wide-band signal into individually transmittable subbands. The wide-band signal is iteratively filtered in a plurality of stages each adapted to tap off a respective subband. Phase conversion is effected between the filter stages upon the signals iterative from each stage to a successive stage in the iterative filtering of said wide-band signal. The output of a preceding stage is used to phase-modulate the input to a succeeding stage.

3,619,782

COHERENT CATV TRANSMISSION SYSTEM

Lyle S. Stokes, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 28, 1966, Ser. No. 523,653
Int. Cl. H04h *1/04*; **H04b** *7/14*
U.S. Cl. 325—9 **3 Claims**



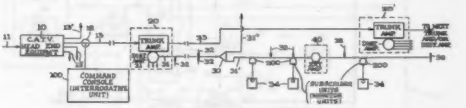
A community antenna television system wherein one or more microwave transmission links are used between the CATV receiving unit and the user's receivers. In accordance with the invention, the undesirable effects caused by slight frequency differences between the directly transmitted television signals and the relayed television signals are eliminated. This is accomplished by providing at the microwave transmitter a pilot signal having a frequency which is an integral submultiple of the microwave carrier frequency. This pilot signal is transmitted, together with the television broadcast signals over the microwave transmission link or links. At the microwave receiver the pilot signal, together with an integral submultiple of the local oscillator, is utilized in a phase-locked loop to synchronize the local oscillator frequency with the microwave carrier frequency.

3,619,783

MEANS FOR DETERMINING TELEVISION CHANNEL USE IN A COMMUNITY ANTENNA TELEVISION SYSTEM

Thomas H. Ritter, Lompoc, Calif., assignor to H & B Communications Corporation, Beverly Hills, Calif.

Continuation of application Ser. No. 613,249, Feb. 1, 1967, now abandoned. This application Sept. 30, 1970, Ser. No. 77,019
Int. Cl. H04h *9/00*
U.S. Cl. 325—31 **6 Claims**



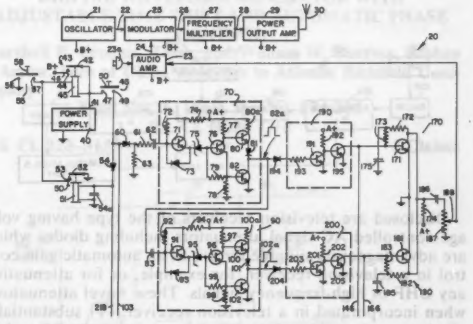
Means to determine the channel to which a subscriber on a community antenna television system is tuned utilizing various embodiments of command console and subscriber units utilizing a radio frequency carrier wave generated by the local oscillator of the subscriber's sets and receiving the information upon interrogation of the subscriber unit by the command console. Interrogation and return signals may be either modulated radio frequency signals or audio tones.

3,619,784

TRANSMITTER WITH MEANS FOR GENERATING THE CARRIER WAVE BEFORE GENERATING THE MODULATION COMPONENTS

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr.

Filed Mar. 3, 1970, Ser. No. 16,037
Int. Cl. H04b *1/02*
U.S. Cl. 325—155 **18 Claims**



There is disclosed an electronic switching device having a transmitter-energized position for coupling a source of operating voltage to a carrier-wave-generating circuit, a further switch coupled to the electronic switch having one

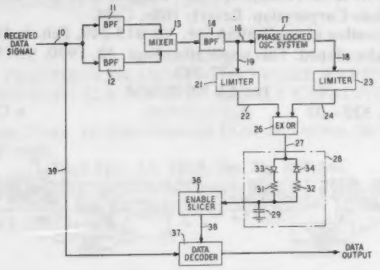
position causing the electronic switch to be placed in its transmitter-energized position, a control circuit which provides energizing signals when the further switch is placed in its first position and then in its second position, which energizing signals cause a circuit to generate information for modulation on the carrier wave, a holding circuit which, in the presence of the energizing signals, maintains the energizing switch closed, despite placement of the further switch in its second position.

3,619,785

SYSTEM FOR DETECTING THE PRESENCE OF A RECEIVED DATA SIGNAL

Cecil W. Farrow, Monmouth Hills, and Louis N. Holzman, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 26, 1969, Ser. No. 836,741
Int. Cl. Ho4h *1/10;* **H03g** *5/100*
U.S. Cl. 325—323 **1 Claim**



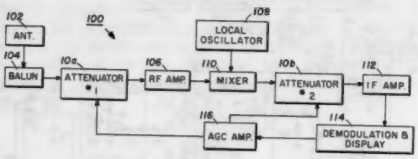
A system is disclosed for detecting the presence of a received data signal in which a pair of band-pass filters is employed to separate out two pilot tones from the received signal. A mixer is employed to generate a difference frequency which drives a phase-locked oscillator system. The phase-locked oscillator system provides an output signal having the same frequency and phase as the average value of the difference signal. The phase relationship between the difference signal and the output from the phase-locked oscillator system is compared to provide a signal for enabling a data decoding circuit.

3,619,786

SOLID-STATE VHF ATTENUATOR AND TV RECEIVER

Donald L. Wilcox, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1969, Ser. No. 859,600
Int. Cl. Ho4b *1/18*
U.S. Cl. 325—411 **8 Claims**



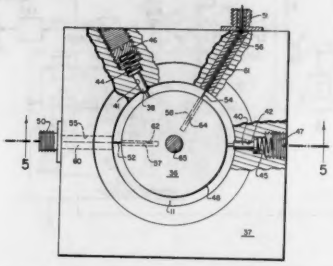
Disclosed are television receivers of the type having voltage-controlled AC signal attenuators including diodes which are advantageously suitable for use as an automatic gain control in a television receiver, for example, or for attenuating any UHF or high-frequency signals. These novel attenuators, when incorporated in a television receiver, (1) substantially eliminate pole-shifting distortion by permitting the RF and IF amplifiers to be operated at one biaspoint, (2) protect the amplifier from overload by preamplification attenuation of the incoming signals, (3) improve system cross modulation, (4) permit use of field effect transistors, and (5) assure minimum degradation of the amplifier noise figure.

3,619,787

MICROWAVE HYBRID WHEEL

Edward Salzberg, 19 Black Oak Road, Wayland, Mass.

Filed May 14, 1970, Ser. No. 37,144
Int. Cl. H03h *7/46;* **H01p** *5/12*
U.S. Cl. 325—446 **11 Claims**



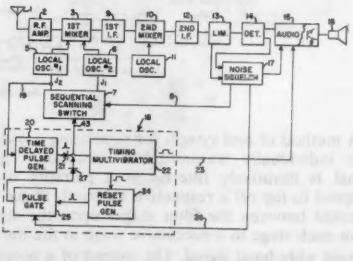
A microwave hybrid ring in modified coaxial line in which the inner conductor is the rim of a wheel mechanically fixedly mounted and electrically grounded at its geometrical center. The electrical grounding at the center may be at the design frequency through a choke.

3,619,788

CIRCUIT FOR GIVING PRIORITY TO ONE OF A PLURALITY OF AUTOMATICALLY MONITORED CHANNELS IN A RECEIVER

Olin S. Giles, Jr., and Seymour Paul, Jr., both of Lynchburg, Va., assignors to General Electric Company

Filed Apr. 14, 1969, Ser. No. 815,998
Int. Cl. H04b *1/28*
U.S. Cl. 325—465 **7 Claims**



A receiver is recurringly switched between channels until a signal is received and the receiver is locked onto that channel. If the receiver is locked on the nonpriority channel, a circuit is actuated to sample the priority channel repeatedly to determine whether a signal has since been received on the priority channel. If a signal is sensed on the priority channel during the sampling intervals, the receiver is switched from the nonpriority channel to the desired priority channel in spite of the presence of the signal on the nonpriority channel.

3,619,789

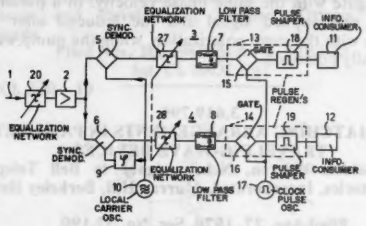
RECEIVER WITH PRE AND PAST DETECTION PHASE EQUALIZATION

Frank De Jager, and Petrus Josephus Van Gerwen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 30, 1968, Ser. No. 787,744
Claims priority, application Netherlands, Jan. 3, 1968, 6800093
Int. Cl. H04b *1/10*
U.S. Cl. 325—480 **7 Claims**

A receiver for use with orthogonal modulation signals transmitted along a transmission link having a particular phase shift characteristic features predetection and postdetection phase equalizers. The predetection equalizer

produces with the link phase characteristic a symmetrical about the carrier frequency phase characteristic. The postdetection equalizer produces with both the transmission link and predetection equalizer a linear phase characteristic.

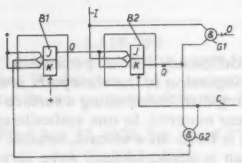


3,619,790

CIRCUIT FOR SELECTIVELY SUPPRESSING A PULSE IN A PULSE TRAIN

Richard N. Brooksbank, Beeston, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Filed Mar. 13, 1970, Ser. No. 19,187
Claims priority, application Great Britain, Apr. 26, 1969, 21,425/69
Int. Cl. H03k *17/26*
U.S. Cl. 328—99 **1 Claim**



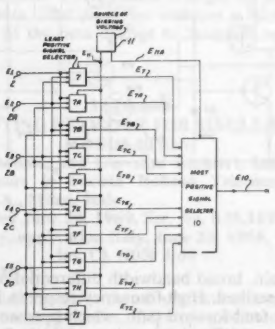
A circuit for selectively suppressing a pulse in a pulse train utilizing first and second bistable devices and first and second two input gates. The circuit normally permits the passage of a train of pulses from an input terminal, but upon the application of a command signal at a command terminal, a pulse of the train is suppressed without mutilating the other pulses, actual suppression being accomplished by the response of said second bistable device to the trailing edge of the pulses of said pulse train.

3,619,791

INTERMEDIATE AMPLITUDE SIGNAL SELECTOR

Harold Moreines, Springfield, N.J., assignor to The Bendix Corporation

Filed Sept. 23, 1969, Ser. No. 860,315
Int. Cl. H03k *5/20*
U.S. Cl. 328—117 **9 Claims**



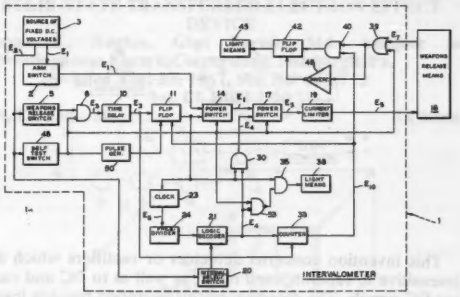
An intermediate amplitude signal selector for selecting the *r*th ranking signal from *m* applied signals, where *m* is greater than three and *r* is the ranking in amplitude, comprising a plurality of gating circuits each receiving a different group of signals less than *m* and providing a signal corresponding to one of the applied signals whose amplitude is related to the other signals of the group, the circuit receiving a group including the *r*th ranking signal providing a signal corresponding thereto, and a gating network connected to the gating circuits and receiving the signals therefrom and providing a signal corresponding to the *r*th ranking signal.

3,619,792

ADJUSTABLE INTERVALOMETER INCLUDING SELF-TESTING MEANS

John M. Capeci, Little Ferry; Roger J. Talish, Fairfield, and Kenneth J. Urgovitch, Clifton, all of N.J., assignors to The Bendix Corporation

Filed Oct. 1, 1969, Ser. No. 862,823
Int. Cl. G01r *29/02;* **H03k** *5/00;* **F41f** *5/00*
U.S. Cl. 328—130 **7 Claims**



An intervalometer in which a direct current voltage is modulated to provide a release pulse train to object release means, each pulse releasing an object, which may be a weapon such as a bomb, or a similar type of weapon. The intervalometer includes a time interval select circuit for controlling the time interval between object releases and providing a control pulse train output. A start release sequence circuit, when manually activated, modulates the direct current voltage in accordance with the control pulse train to provide the release pulse train.

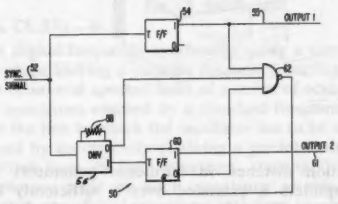
The intervalometer also includes a circuit for self-testing the intervalometer and indicators for indicating that a release sequence is occurring and for indicating a failure to release an object.

3,619,793

DIGITAL WAVEFORM GENERATOR WITH ADJUSTABLE TIME SHIFT AND AUTOMATIC PHASE CONTROL

Marshall B. Broome, Tulsa, and William W. Burress, Broken Arrow, both of Okla., assignors to Atlantic Richfield Company

Filed Nov. 5, 1969, Ser. No. 874,206
Int. Cl. H03k *1/18*
U.S. Cl. 328—155 **2 Claims**



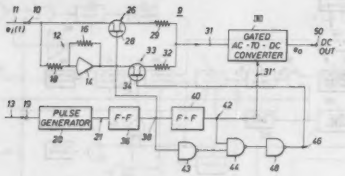
A circuit for generating two pulse waveforms having a desired time and phase relationship, and an optically pumped

magnetometer utilizing that circuit. A synchronization signal toggles a bistable multivibrator to provide one pulse waveform. The synchronization signal also triggers a monostable multivibrator, the output of which toggles a second bistable multivibrator to provide the second pulse waveform. The time the monostable multivibrator remains in its unstable state determines the desired time relationship between the two waveforms. Should the waveforms assume the wrong phase relationship, gating circuitry returns them to the proper phase relationship. The circuit can be utilized to provide a phase reference signal and a sweep control signal in an optically pumped magnetometer, giving the desired time and phase relationship between those two signals.

3,619,794
METHOD AND SYSTEM FOR DETECTING NOISE-CONTAINING SIGNALS

Peter L. Richman, 22 Barberry Road, Lexington, Mass.

Filed Feb. 13, 1970, Ser. No. 11,179
Int. Cl. H03b 1/04; H03k 17/60
U.S. Cl. 328—165 **23 Claims**

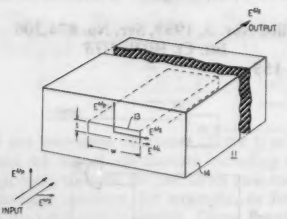


This invention concerns detectors or rectifiers which are insensitive to superimposed noise, as well as to DC and varying DC signals. The detectors of this invention provide insensitivity to higher-order time functions by gating with different gain factors the successive half-cycles, or successive groups of half-cycles, in the input AC signal, the AC value of which it is desired to detect. The insensitivity can be extended as well to sums of higher-order time functions. The invention is particularly adapted to high-speed AC measurements in situations whose characteristics include noise, drift, or "-drool" phenomena.

3,619,795
PHASE MATCHING IN DIELECTRIC WAVEGUIDES TO EXTEND THE INTERACTION DISTANCE OF HARMONIC GENERATORS AND PARAMETRIC AMPLIFIERS

Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 10, 1970, Ser. No. 27,331
Int. Cl. H03f 7/04
U.S. Cl. 330—4.6 **4 Claims**

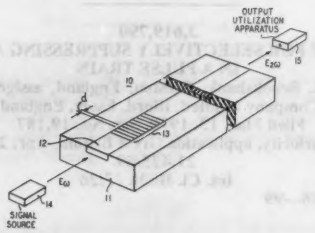


The interaction distance in harmonic generators and parametric amplifiers is extended over a sufficiently long distance to effect optimum frequency conversion by forming the nonlinear dielectric medium into a waveguide, and proportioning its cross-sectional dimensions such that the relevant waves propagate with the same phase velocity. In an harmonic generator, the waveguide is proportioned such that the applied fundamental frequency wave and the orthogonally polarized, harmonic wave induced in the medium propagate with the same phase velocity. In a parametric amplifier, the applied signal and the induced idler wave propagate with the same polarization, while the pump wave is orthogonally polarized.

3,619,796
PHASE-MATCHING ARRANGEMENTS IN PARAMETRIC TRAVELING-WAVE DEVICES

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 27, 1970, Ser. No. 32,190
Int. Cl. H03f 7/04
U.S. Cl. 330—4.6 **8 Claims**

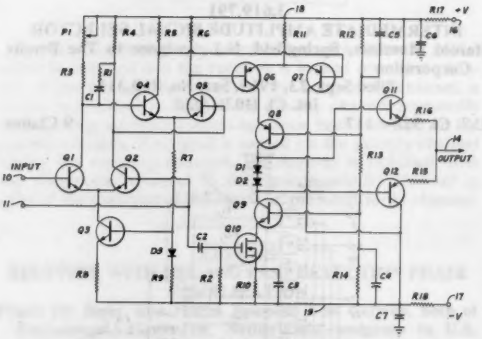


The phase deficiency in a parametric traveling-wave device, due to dispersion in the wavepath, is compensated by means of a grating distributed along a surface of an otherwise uniform nonlinear material. In one embodiment of the invention the grating is fixed. In a second, tunable embodiment of the invention, an acoustic surface wave serves as a moving grating.

3,619,797
OPERATIONAL AMPLIFIER

James W. Merrick, El Paso, Tex., assignor to Globe Universal Sciences, Inc., El Paso, Tex.

Filed Jan. 21, 1970, Ser. No. 4,622
Int. Cl. H03f 1/02, 3/16, 3/04
U.S. Cl. 330—9 **1 Claim**



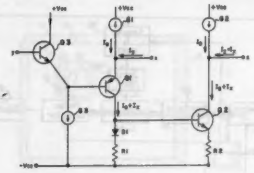
A high-gain, broad bandwidth differential operational amplifier is described. High-frequency response is increased by means of a feed-forward path, which bypasses the cascaded low-frequency differential stages at high frequencies and feeds the signal directly to a common base cascade output stage so that the rolloff of the low-frequency cascaded stages does not affect the high-frequency response of the amplifier.

3,619,798

THREE-PORT ELECTRICAL NETWORK

Kenneth C. Smith, Weston, Ontario, and Adel S. Sedra, Toronto, Ontario, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 20, 1969, Ser. No. 878,823
Int. Cl. H03f 3/42
U.S. Cl. 330—19 4 Claims



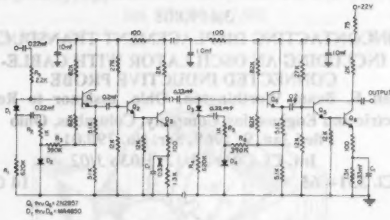
A three-port electrical network that has a first port whose impedance is high and whose voltage controls the potential of a second port which has low or zero impedance and through which an independent current flows to reappear at a third port at high impedance which consists of a unity gain amplifier having high input impedance and low output impedance and means for deriving a current related to the current flowing in the output port of the amplifier and means for conveying this current to a third port. The latter two means are current followers energized from constant current sources.

3,619,799

NUCLEAR HARD VIDEO AMPLIFIER

Harlan J. Oelke, Washington, D.C., assignor to the United States of America as represented by the Secretary of the Army

Filed Jan. 22, 1970, Ser. No. 5,075
Int. Cl. H03g 3/30
U.S. Cl. 330—29 7 Claims



A video amplifier circuit which exhibits stability of gain under neutron bombardment. Nuclear radiation in the order of 10^{15} neutrons/cm.^{2} (nvt) causes changes up to 90 percent in transistor beta. The amplifier includes a bias circuit for compensation of the beta change to maintain near constant gain.

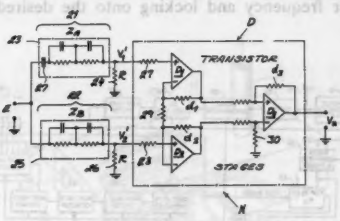
3,619,800

PHASE-SHIFTING NETWORK FOR SINGLE-SIDEBAND MODULATION

Evangelo Lyghounis, and Giovanni Barbieri, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed June 20, 1969, Ser. No. 835,189
Claims priority, application Italy, June 26, 1968, 18230A/68
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 5 Claims

Two phase-shifting networks of identical construction, differing only in the magnitudes of their impedances, comprise each two L-sections with partly capacitive series arms and resistive shunt arms working into a differential amplifier to generate, in response to an input voltage applied to both networks in parallel, two output voltages maintaining a constant amplitude and phase relationship through a wide band of frequencies; the two L-sections of each network, connected



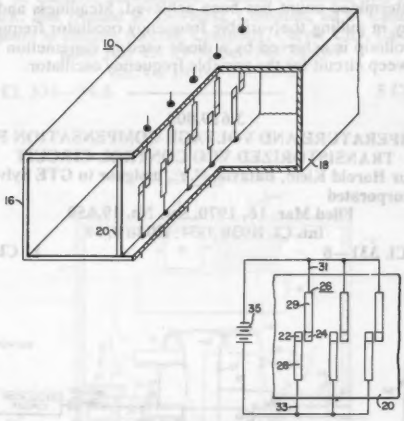
in parallel to a common voltage source, differ from each other by the presence of a series condenser in one L-section.

3,619,801

SOLID-STATE TRANSFERRED ELECTRON EFFECT DEVICE

Wayne E. Hughes, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1967, Ser. No. 662,712
Int. Cl. H03f 3/60
U.S. Cl. 330—56 4 Claims



This invention is directed to a microwave solid-state device incorporating semiconductor devices of the type which exhibit the transferred electron effect. A plurality of these devices provided within a transmission line may provide greater amplification or a larger oscillator output for microwave applications over that of a single device.

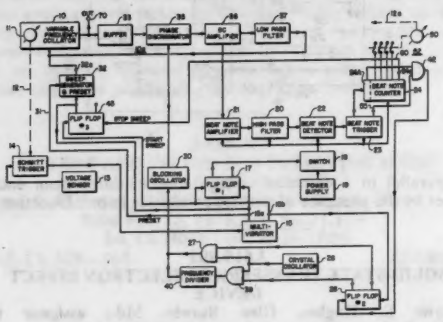
3,619,802

FREQUENCY SYNTHESIZER, assignor to Dieter R. Lohrman, Eatontown, N.J.

Filed May 20, 1969, Ser. No. 826,114
Int. Cl. H03b 3/04
U.S. Cl. 331—4 5 Claims

A digital frequency synthesizer using a sampling principle for phase locking a variable frequency oscillator to a desired one of several spectral lines of a series of accurately obtainable spectrums created by a standard frequency source such that the line to which the oscillator has to be locked is determined by successively counting a predetermined number of spectral lines of each spectrum, starting from the known reference point at each spectrum established by using another one of said spectrums with lines spaced farther apart in frequency than the spectral lines of the given spectrum, the counting being done without opening the oscillator phase lock loop and by imposing a slow frequency drift on the vari-

able frequency oscillator, thus beating it with successive lines of a given spectrum and deriving an output from the counting means for counting lines of the spectrum of closest frequency spacing, terminating the sweep of the variable frequency oscillator frequency and locking onto the desired spectral



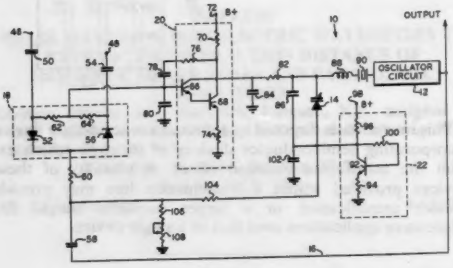
line of said spectrum of closest spacing which is that line reached by the variable frequency oscillator when the predetermined count has been achieved. Steadiness and accuracy in pulling the variable frequency oscillator frequency controlloop is achieved by a diode used in conjunction with the sweep circuit for the variable frequency oscillator.

3,619,803

TEMPERATURE AND VOLTAGE COMPENSATION FOR TRANSISTORIZED VCO CONTROL CIRCUIT

Arthur Harold Klein, Batavia, N.Y., assignor to GTE Sylvania Incorporated

Filed Mar. 16, 1970, Ser. No. 19,650
Int. Cl. H03b *3/04*; H04n *9/44*
U.S. Cl. 331—8 **11 Claims**



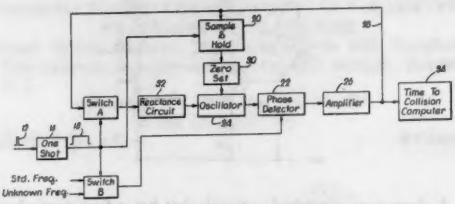
Compensation for the effects of both ambient temperature and supply voltage variations upon a transistorized DC amplifier delivering a control voltage to the varactor frequency determining element of a voltage-controlled oscillator is provided by a regulator transistor connected to provide a source of reference potential for the varactor and a source of base bias voltage for the DC amplifier, whereby temperature of supply voltage induced changes in the output voltage of the DC amplifier and the reference potential provided by the regulator tend to track each other so as to stabilize the voltage difference across the varactor. In a phase lock loop application, the bias voltage provided by the regulator is applied through a phase detector to the input base electrode of the DC amplifier so as to utilize the high-impedance properties of the phase detector at the amplifier input.

3,619,804

FREQUENCY DISCRIMINATOR USING AN INTERMITTENTLY PHASE-LOCKED LOOP

William E. Mears, Kansas City, Kans., assignor to Wilcox Electric Company, Inc., Kansas City, Mo.

Filed Jan. 23, 1969, Ser. No. 793,325
Int. Cl. H03b *3/04*
U.S. Cl. 331—8 **26 Claims**



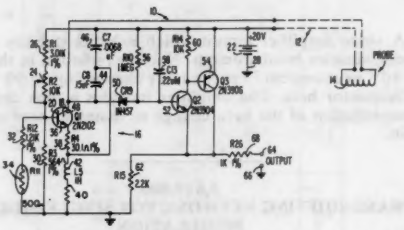
A frequency discriminator which compares a standard and an unknown frequency and generates a pulse output, the amplitude of which is proportional to the difference between the two frequencies. An amplitude sampling bridge is employed as a phase detector and is insensitive to harmonics, in that the standard frequency may be a subharmonic of the actual frequency with which the unknown frequency is to be compared. The standard frequency and the unknown frequency are delivered to the bridge in succession and individually compared with the output of an electrically controllable, variable frequency oscillator which is initially frequency-locked to the standard frequency, via a first control circuit and then via a second control circuit frequency-locked to the unknown frequency by the output pulse, the amplitude of that pulse being proportional to the frequency change of the oscillator output in proceeding from its first frequency-locked condition to its ultimate frequency.

3,619,805

NONCONTACTING DISPLACEMENT TRANSDUCER INCLUDING AN OSCILLATOR WITH CABLE-CONNECTED INDUCTIVE PROBE

Stephen F. Bean, Worthington, Ohio, assignor to Reliance Electric and Engineering Company, Columbus, Ohio

Filed Jan. 9, 1969, Ser. No. 790,011
Int. Cl. C01r *33/12*; H03b *3/02*
U.S. Cl. 331—65 **14 Claims**



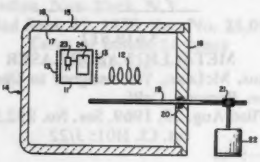
Disclosed is an eddy-current-type noncontacting displacement transducer and gage for gaging the distance between a probe tip and a metallic surface. The transducer comprises a modified common base transistor oscillator incorporating the probe coil as the oscillator resonant circuit. The base is unbypassed to increase linearity and operation at low frequency, i.e. 25 kHz. reduces capacitive sensitivity so that the transducer may be used with long cables.

3,619,806

TEMPERATURE-CONTROLLED CRYSTAL OSCILLATOR

David H. Phillips, Accokeek, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 21, 1969, Ser. No. 878,729
Int. Cl. H03b 5/32; H05b 1/00
U.S. Cl. 331—69 3 Claims



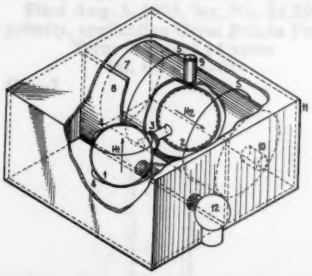
A crystal-controlled oscillator located within an (inner) oven is maintained at a temperature such that the crystal resonates at the desired frequency. The temperature controller for the oven and the oven are located within a second (outer) oven maintained at a constant temperature by a second temperature controller. In order to correct for any temperature variations in the heat path within the outer oven such that the inner oven is not at the desired temperature, a rod extending from outside the outer oven is positioned near the inner oven temperature controller. The rod may then be adjusted (manually or by remote control) from outside the outer oven thereby varying the heat path to the controller without requiring disassembly of the composite device.

3,619,807

MASER OSCILLATOR HAVING TWO CONNECTED GAS CELLS WITH DIFFERENTLY ORIENTED MAGNETIC FIELDS

Henri Brun, Paris, France, assignor to Thomson-CSF

Filed Mar. 23, 1970, Ser. No. 21,859
Claims priority, application France, Mar. 24, 1969, 69/08549
Int. Cl. H01s 1/06
U.S. Cl. 331—94 8 Claims



A maser oscillator comprises two cells, connected to each other through a duct, which are filled with atomic hydrogen and respectively subjected to crossed magnetic fields. One of the cells is lined internally with a film of a substance preventing atom misalignment and is located inside an UHF cavity.

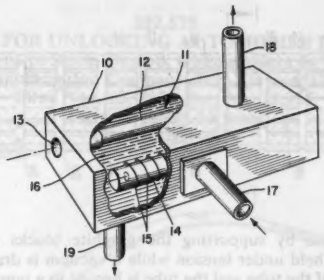
3,619,808

LASER HEAD COOLING SYSTEM

Gary David Tomkins, Cypress, and Donald Victor Smart, Redondo Beach, both of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 6, 1970, Ser. No. 52,407
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 2 Claims

An improved laser head cooling system is provided by circulating a special liquid coolant which is substantially chemically inert to avoid contamination, is electrically nonconducting, and has a substantially greater optical coupling transmission characteristic than water. To prevent deterioration of the liquid coolant itself, the quartz envelope for the light pump in the laser head is especially designed to be substantially opaque to short ultraviolet radiation.

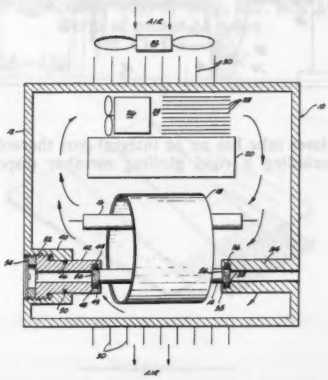


3,619,809

SEALING ARRANGEMENT FOR LASER COOLING SYSTEM

Peter S. Ozzimo, Hawthorne; William F. Stokes, Jr., Buena Park, and Donald R. Dewhirst, Compton, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 13, 1970, Ser. No. 54,139
Int. Cl. H01s 3/04, 3/02
U.S. Cl. 331—94.5 5 Claims



A laser cooling system is disclosed wherein high-pressure coolant gas is circulated past a rod of laser material, and a readily removable arrangement is provided for sealing the ends of the rod to the device housing in a manner preventing the emitter laser radiation from passing through the coolant gas. The ends of the laser rod are supported in tubes extending inwardly from opposite walls of the housing, and O-rings are used to seal the rod to the tubes. Chromium bands disposed on the lateral surface of the rod adjacent the O-rings protect the O-rings from damage by scattered radiation.

3,619,810

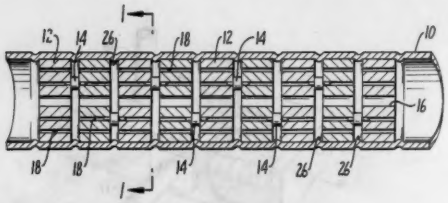
ION LASER CORE

Wayne S. Mefferd, Palo Alto, Calif., assignor to Coherent Radiation Laboratories, Inc., Palo Alto, Calif.

Filed Aug. 19, 1968, Ser. No. 753,684
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 1 Claim

An ion laser core and method of making the same where the core is formed of a plurality of spaced-apart graphite

blocks containing aligned central bores on the optical axis of a laser tube. The graphite blocks are keyed to the tube so that the blocks do not rotate, and the tube is shrunk fit onto the the peripheries of the graphite blocks. Shrink fitting is accomplished by supporting the graphite blocks on a wire which is held under tension while a vacuum is drawn on the interior of the tube and the tube is heated to a temperature at which it flows.



3,619,811

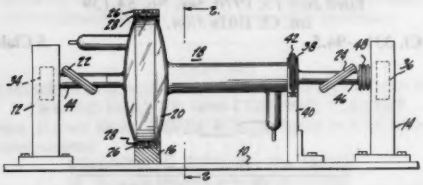
GAS LASER TUBE MOUNT

Donald B. Kaiser, and John A. Powell, both of Lancaster, Pa., assignors to RCA Corporation

Filed Oct. 17, 1968, Ser. No. 768,409

Int. Cl. H01s *3/02*

U.S. Cl. 331—94.5 **5 Claims**



A gas laser tube has an an integral part thereof mounting means including a rigid girdling member disposed intermediate the ends of the tube, which girdling member circumferentially surrounds the envelope of the tube. This girdling member is in its entirety spaced from the envelope by a plurality of circumferentially spaced pads of a resilient adherent material, such as silicone rubber, which bonds and mechanically couples the girdling member to the envelope. This permits a prealigned gas laser to be shipped without loss of alignment due to vibration of the laser tube during shipping. It also protects the frangible envelope of the laser tube from breakage.

3,619,812

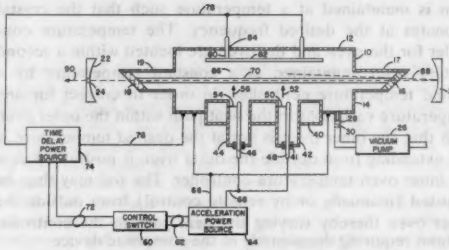
METALLIC VAPOR LASER

John F. Asmus, McLean, Va., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 25, 1969, Ser. No. 852,533

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 **7 Claims**

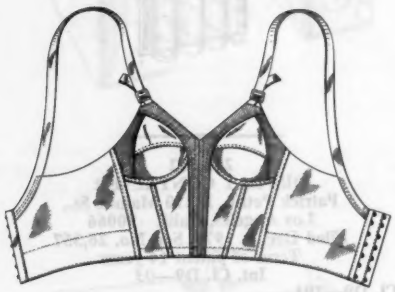


The method and apparatus for pulse-broadening metallic vapor lasers having self-terminating laser transitions by flowing excited metal vapor or atoms through an optical resonator. A high-velocity metallic vapor in the form of a plasma coagulum is created by exploding wires and magnetic fields, or by ablating metal through explosive or plasma techniques. When the vapor front reaches the laser chamber, a cross-excitation discharge is initiated along the direction of the flow vector to generate the population inversion as the vapor flows across the optical axis of the optical resonator.

DESIGNS

NOVEMBER 9, 1971

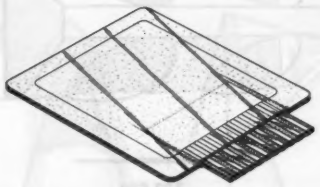
222,573
BRASSIERE
Charles M. Sachs, Teaneck, N.J., and William C. Hittel, New Hyde Park, N.Y., assignors to International Playtex Corporation, New York, N.Y.
Filed Sept. 21, 1970, Ser. No. 25,094
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



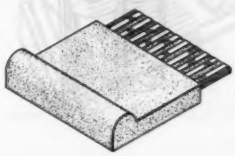
222,574
GARDENING IMPLEMENT
John F. Fielden, Pear Tree Cottage, 21 Victoria St., Fleckney, Leicestershire, England
Filed Aug. 3, 1970, Ser. No. 24,259
Claims priority, application Great Britain Feb. 10, 1970
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7

222,575
TOOL FOR UNLOCKING AUTOMOBILE DOORS
George L. Steck, Dayton, Ohio, assignor to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed Nov. 12, 1970, Ser. No. 25,926
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16

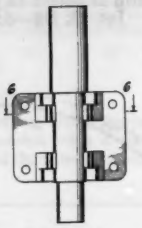
222,576
ELECTRICAL CARD KEY
Alfiero F. Balzano, Sunland, Calif., assignor to R. B. Phinizy, Anaheim, Calif.
Original design application Dec. 12, 1969, Ser. No. 20,484, now Patent No. 220,557, dated Apr. 20, 1971. Divided and this application Aug. 5, 1970, Ser. No. 24,318
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—136



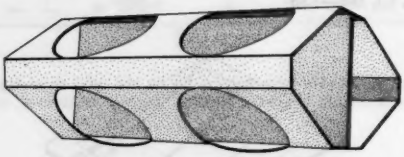
222,577
ELECTRICAL KEY
Alfiero F. Balzano, Sunland, Calif., assignor to R. B. Phinizy, Anaheim, Calif.
Original design application Dec. 12, 1969, Ser. No. 20,484, now Patent No. 220,557, dated Apr. 20, 1971. Divided and this application Aug. 5, 1970, Ser. No. 24,322
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—136



222,578
TUBE SUPPORT BRACKET
James H. Walker and James F. Murphy, South El Monte, Calif., assignors to Akra Stamp Machine Co., Inc., South El Monte, Calif.
Filed June 19, 1970, Ser. No. 23,870
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



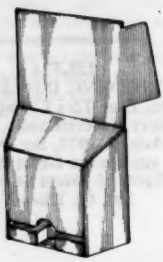
222,579
CARTON FOR GLASSES
Richard K. Oglesbee, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sept. 17, 1970, Ser. No. 25,037
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—176



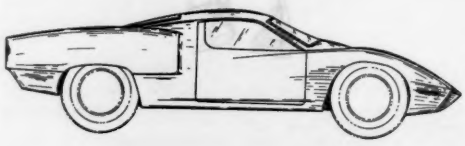
222,580
DISPLAY PACKAGE FOR BATTERIES OR THE LIKE
Keiichi Nakakuma, Tokyo, Japan, assignor to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan
Filed June 30, 1970, Ser. No. 23,763
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183

222,581
DISPLAY PACKAGE FOR BATTERIES OR THE LIKE
Keiichi Nakakuma, Tokyo, Japan, assignor to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan
Filed June 30, 1970, Ser. No. 23,762
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183

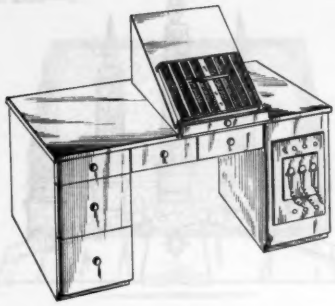
222,582
DISPLAY CONTAINER
Patrick Petrie, 12210 Malone St., Los Angeles, Calif. 90066
Filed Dec. 8, 1970, Ser. No. 26,357
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191

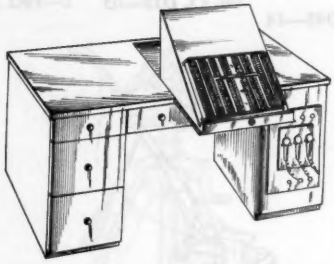


222,583
VEHICLE BODY
Robert E. Watson, Evergreen, Colo., assignor to Dune Buggy, Inc., Englewood, Colo.
Filed Dec. 7, 1970, Ser. No. 26,329
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



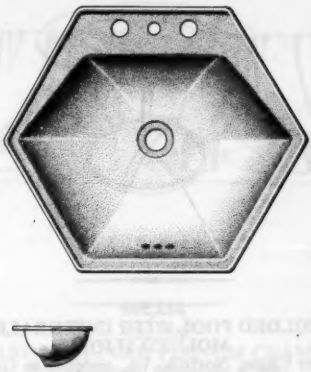
222,584
OCULIST'S DESK
David M. Lieberman, 9 Prospect Park W., Brooklyn, N.Y. 11215
Filed Aug. 5, 1970, Ser. No. 24,331
Term of patent 14 years
Int. Cl. D24—*02*; D6—*01*
U.S. Cl. D16—2



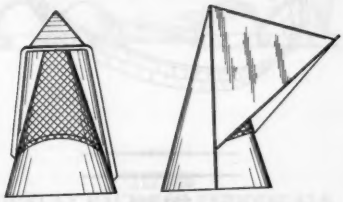


222,585
FISHING LURE
Jack K. Smithwick, P.O. Box 1205, Shreveport, La. 71102
Filed Sept. 15, 1970, Ser. No. 25,012
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

222,586
LAVATORY WASH BASIN
Paul M. Hives, 770 NE. 128th St., North Miami, Fla. 33161
Filed Aug. 11, 1970, Ser. No. 24,416
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

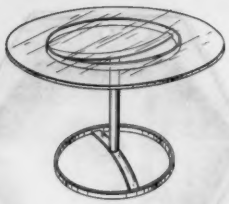


222,587
VENTILATOR HOODS
Lester L. Miller, 2226 Rogero Road, Jacksonville, Fla. 32211
Filed June 24, 1970, Ser. No. 23,649
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153

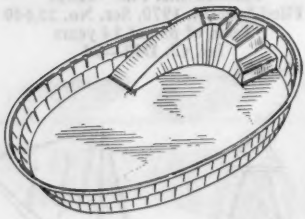


222,588
FOOT CONTROL FOR DICTATING MACHINE
Edgard R. Wiklund, 1681 Kingsdown Circle, Dunwoody, Ga. 30338, and Robert N. Fink, 2660 Laurel Ridge Drive, Decatur, Ga. 30033
Filed Nov. 27, 1970, Ser. No. 26,179
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

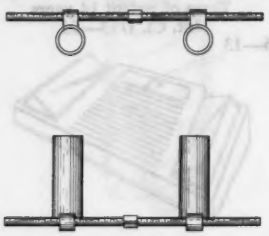
222,589
TABLE
Gardner Leaver, New York, N.Y., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed June 22, 1970, Ser. No. 23,580
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



222,590
MOLDED POOL WITH INTEGRALLY MOLDED SLIDE
Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.
Filed Sept. 22, 1970, Ser. No. 25,144
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



222,591
WHEEL CHOCK
Joseph F. Steinke, Brandon Road, Rte. 4, Joliet, Ill. 60436
Filed June 22, 1970, Ser. No. 23,607
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D41—1

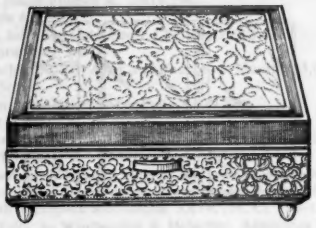


222,592
CANDOLIER
Norman C. Lee, Rocky Mount, N.C., assignor to Carolina Enterprises, Inc., Tarboro, N.C.
Filed July 6, 1970, Ser. No. 23,843
Term of patent 14 years
Int. Cl. D26—*05, 01*
U.S. Cl. D48—20

222,593
VACUUM CLEANER
Charles H. McFarland, Rocky River, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Apr. 1, 1970, Ser. No. 22,194
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—14

222,594
TURNS COUNTING DIAL
Paul R. Trautmann, Whittier, Roger G. Ignon, Santa Monica, and Ronald E. Loosen, Woodland Hills, Calif., assignors to Spectrol Electronics Corporation, Industry, Calif.
Filed Feb. 24, 1970, Ser. No. 21,568
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

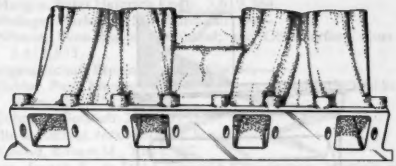
222,595
COMBINED MUSIC BOX AND CLOCK
Waldemar Blessing, Waldkirch, Breisgau, Germany, assignor to Blessing-Werke KG, Waldkirch im Breisgau, Germany
Filed Jan. 30, 1970, Ser. No. 21,164
Claims priority, application Germany Aug. 5, 1969
Term of patent 14 years
Int. Cl. D17—*05*
U.S. Cl. D56—1



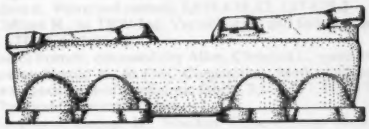
222,596
CAMERA TRIPOD
Courtney A. Leubner, Oak Brook, Ill., assignor to Quick-Set, Incorporated
Filed Sept. 4, 1969, Ser. No. 19,020
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

222,597
PENCIL
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Nov. 25, 1970, Ser. No. 26,163
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

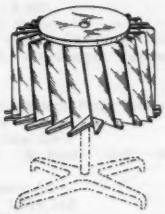
222,598
INTAKE MANIFOLD
Philip Weiand, Glendale, Calif. (2737 San Fernando Road, Los Angeles, Calif. 90065)
Filed Dec. 11, 1970, Ser. No. 26,412
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1



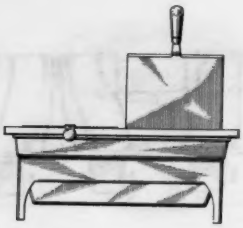
222,599
INTAKE MANIFOLD PLENUM CHAMBER
Philip Waiand, Glendale, Calif. (2737 San Fernando Road, Los Angeles, Calif. 90065)
Filed Dec. 11, 1970, Ser. No. 26,403
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1



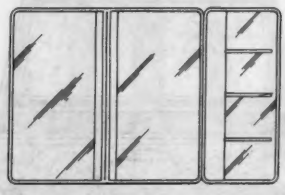
222,600
DISPLAY RACK FOR PERIODICALS
Stanley Wells, Bridgewater, Conn., assignor to Mar-Line Displays, Inc., Mount Vernon, N.Y.
Filed July 2, 1970, Ser. No. 23,810
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



222,601
FOOD COOKING GRILL
Edward M. Marshall, 8107 SW. 72nd Ave., Apt. 102 E, Miami, Fla. 33143
Filed Nov. 16, 1970, Ser. No. 26,033
Term of patent 3½ years
Int. Cl. D07—*02*
U.S. Cl. D81—10



222,602
STORAGE WALLET FOR WATCHBAND CALENDARS
Patrick Petrie, P.O. Box 66425, Los Angeles, Calif. 90066
Filed Jan. 12, 1970, Ser. No. 20,872
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF NOVEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A Brassard, Hans-Joachim; and Jutten, Heinz-Josef, to Glanzstoff AG. Apparatus for the melt extrusion of linear fiber- forming or film-forming thermoplastic polymers. 3,618,167, Cl. 18-855.

AB Akerlund & Rausing: *See—*
Odenhagen, Rune G. A., 3,618,481.

AB Tetra Pak: *See—*
Delme, Johan Vilhelm R., 3,618,290.

Abbott, Clyde A.: *See—*
Yarlott, John M.; and Abbott, Clyde A.,3,618,638.

Abbott Laboratories: *See—*
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Akers, Robert M.; and Westfall, Harold L., to Akers, Incorporated, mesne. Apparatus for drying refrigerant. 3,618,771, Cl. 210-95.

Akhunov, Albert Musagitovich; Maxutov, Rafkhat; Gubarev, Yakov Fedorovich; Zalyaliev, Mansur Abdullovich; Sabirov, Ilgiz Mullayanovich; and Imamutdinova, Khalida Khatimovna. Apparatus for welding glass rods, particularly tubular glass rods. 3,619,158, Cl. 65-152.

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Bates, Robert H.; and Klipstein, Wesley. Elastic push pull batting practice type exercise device. 3,618,942, Cl. 272-82.
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Brink, Mary E. Diaper with fastener. 3,618,608, Cl. 128-287.

Briody, Robert G.; and Cuevas, Ephraim A., to PPG Industries, Inc. Aluminum amalgam preparation. 3,619,176, Cl. 75-68.

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British Lighting Industries Limited: *See—*
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British Titan Products Company Limited: *See—*
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Brochard, Michel. Cutting device. 3,618,465, Cl. 90-13.1

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Brooks, Robert E., to TRW Inc. Optical element for generating contour stripes. 3,619,023, Cl. 350-3.5

Brooks, Robert S.; and Hefliger, Lee O., to TRW Inc. Moire gauging systems. 3,619,064, Cl. 356-109.

Brooksbank, Richard N., to Plessey Company Limited, The. Circuit for selectively surpressing a pulse in a pulse train. 3,619,790, Cl. 328-99.

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Brown, Donald A. Brush surfaced anvil for rotary sheet-cutting equipment. 3,618,436, Cl. 83-37.

Brown, Forbes T.: *See—*
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Brown, Kenard D. Liquid sweeping system employing helical conveyor method and apparatus. 3,618,768, Cl. 210-83.

Brown, Omar L., to Dayton Reliable Tool & Mfg. Company. Tab for easy opening container wall. 3,618,816, Cl. 220-54.

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Brun, Henri, to Thomson-CSF. Maser oscillator having two connected gas cells with differently oriented magnetic fields. 3,619,807, Cl. 331-94.

Bruni, Rudolph H.; and Gillie, Frances B. Article of personal wear and adornment simulating a pocket handkerchief and method of making it. 3,618,142, Cl. 2-279.

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Bryan, Thomas Toplica, to Minnesota Mining and Manufacturing Company. Unitary laminate. 3,619,335, Cl. 161-1.

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Bullock, Charles E., to Carrier Corporation. Single inlet centrifugal fan. 3,619,088, Cl. 417-423.

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Caldwell, John R., to Eastman Kodak Company. Cellulose ester fiber with dihexyl sodium sulfosuccinate therein and dyeing thereof. 3,619,105, Cl. 8-31.

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Cavagnero, Erman V., to Torin Corporation. Preheating and welding method. 3,619,548, Cl. 219-105.

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Bouley, Richard F.; Hansen, Jay M.; and Zwirn, Robert,3,619,500.

LIST OF REISSUE PATENTEES

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PATENTS WERE ISSUED ON THE 9TH DAY OF NOVEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brown, Morris E.: *See*—
Mitchell, John D., Thomson, and Brown. Re. 27,229.
Brundage, Robert W. Pressure balanced bearing loads in hydraulic devices. Re. 27,228, 11–9–71, Cl. 418—71.
Crucible Inc.: *See*—
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Eastman Kodak Co.: *See*—
Mitchell, John D., Thomson, and Brown. Re. 27,229.
Esco Elevators, Inc.: *See*—
Johnston, Everett E. Re. 27,233.
Farmer, John, to Ward Foods, Inc. Juice extraction apparatus. Re. 27,230, 11–9–71, Cl. 127—3.
Fletcher, Peter S. Reclining and rocking chair. Re. 27,231, 11–9–71, Cl. 297—259.
Harnsberger, Bobby G., to Texaco Inc. Permeable cementing composition and method. Re. 27,227, 11–9–71, Cl. 166—276.
Home Metal Products Co.: *See*—
Stalker, James E. Re. 27,225.
Johnston, Everett E., to Esco Elevators, Inc. Hydraulic elevator control systems. Re. 27,233, 11–9–71, Cl. 187—608.
Koehring Co.: *See*—
Parrett, John T. Re. 27,224.
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Moskowitz, Arthur, Kovach, and Wells. Re. 27,226.
McLorg, Terence W. Air supported shelter. Re. 27,232, 11–9–71, Cl. 52—2.
Mitchell, John D., K. W. Thomson, and M. E. Brown, to Eastman Kodak Co. Motion picture apparatus with automatic rewind. Re. 27,229, 11–9–71, Cl. 352—124.
Moskowitz, Arthur, C. W. Kovach, and R. G. Wells, to Crucible Inc. Free-machining austenitic stainless steels. Re. 27,226, 11–9–71, Cl. 75—128.
Nelson, Victor R. Press loader and unloader. Re.27,223, 11–9–71, Cl. 214—16.4.
Parrett, John T., to Koehring Co. Fluid feed lines. Re. 27,224, 11–9–71, Cl. 91—462.
Smieja, Alois J. Hydraulic lifting device with weight estimator. Re. 27,234, 11–9–71, Cl. 177—146.
Stalker, James E., to Home Metal Products Co. Flow control for ventilating hood. Re. 27,225, 11–9–71, Cl. 55—470.
Texaco Inc.: *See*—
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Weaver, W. R., Co.: *See*—
Weaver, William R. Re. 27,222.
Weaver, William R., to W. R. Weaver Co. Erector support for telescope sights. Re. 27,222, 11–9–71, Cl. 350—54.
Wells, Ralph G.: *See*—
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Anchor Hocking Corp.: *See*—
Oglesbee, Richard K. 222,579.
Balzano, Alfiero F., to R. B. Phinizy. Electrical card key. 222,576, 11–9–71, Cl. D8—136.
Balzano, Alfiero F., to R. B. Phinizy. Electrical key. 222,577, 11–9–71, Cl. D8—136.
Blessing, Waldemar, to Blessing-Werke KG. Combined music box and clock. 222,595, 11–9–71, Cl. D56—1.
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Hives, Paul M. Lavatory wash basin. 222,586, 11–9–71, Cl. D23—58.
Ignon, Roger G.: *See*—
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Lee, Norman C., Carolina Enterprises, Inc. Candolier. 222,592, 11–9–71, Cl. D48—20.
Leubner, Courtney A., to Quick-Set, Inc. Camera tripod. 222,596, 11–9–71, Cl. D61—1.
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McFarland, Charles H., to The Scott & Fetzer Co. Vacuum cleaner. 222,593, 11–9–71, Cl. D49—14.
Miller, Lester L. Ventilator hoods. 222,587, 11–9–71, Cl. D23—153.
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Walker, James H., and J. F. Murphy, to Akra Stamp Machine Co., Inc. Tube support bracket. 222,578, 11–9–71, Cl. D8—235.
Watson, Robert E., to Dune Buggy, Inc. Vehicle body. 222,583, 11–9–71, Cl. D14—3.
Weland, Philip. Intake manifold. D222,598, 11–9–71, Cl. D77—1.
Weland, Philip. Intake manifold plenum chamber. 222,599, 11–9–71, Cl. D77—1.
Wells, Stanley, Mar-Line Displays, Inc. Display rack for periodicals. 222,600, 11–9–71, Cl. D80—9.
Wiklund, Edgard R. Foot control for dictating machine. 222,588, 11–9–71, Cl. D26—13.

CLASSIFICATION OF PATENTS

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Design Patents

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